MAR 7 1938

March 7, 1938

STEEL

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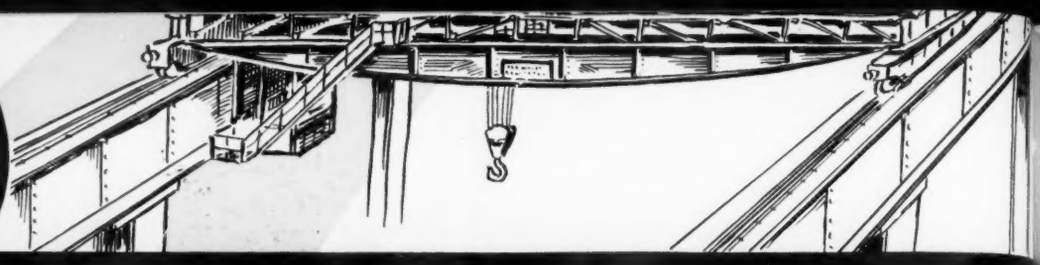

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EC&M Type SA Lifting Magnet, Bulletin 900.

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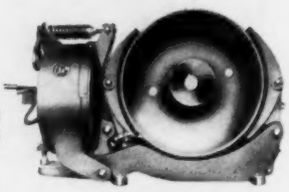
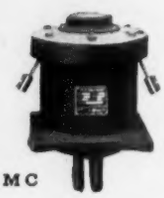


EC&M Type WB Brakes for Electrical and Mechanical Operation Bulletin 1004-B.



EC&M Type MC Solenoid, Bulletin 1010.

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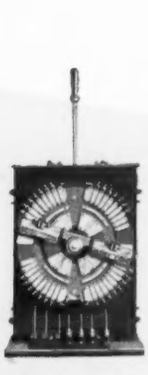

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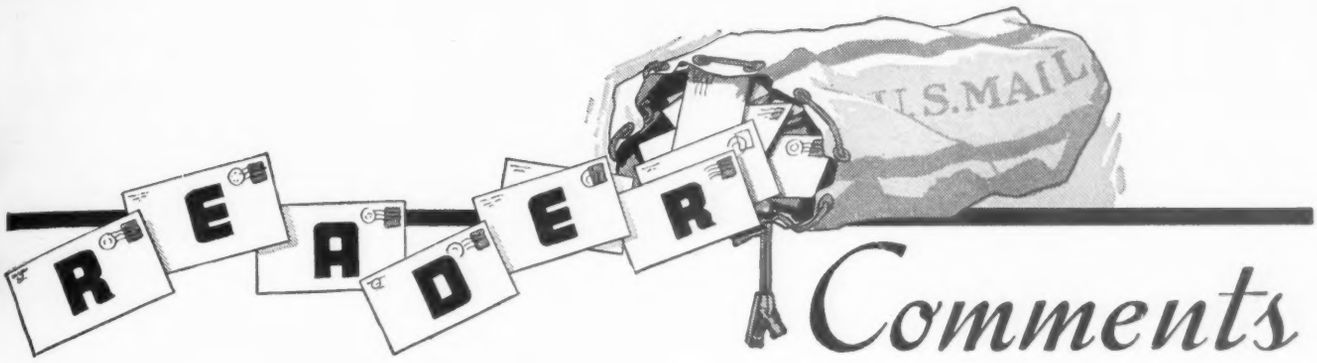

Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

More Steel in Building

To the Editor:

The provision in the New York code (see STEEL, Feb. 28, page 17) which will permit the use of light open-web steel joists is one that I feel will help the structural steel industry, despite the fact that open-web steel joists are not a product of our industry.

As you know, fabricators of structural steel are concerned exclusively with the sale of structural shapes, and open-web joists take the place of the fabricated structural shapes which are the product of our shops. Notwithstanding, I feel that the provision will increase the use of structural shapes for columns because it will enable architects and builders to utilize a type of construction requiring some steel in a class of building where steel has not been used before.

In New York, especially in certain districts, builders have been permitted to erect semifireproof buildings for dwelling purposes. A limited amount of wood has been used. We understand that the open-web steel joists will provide an intermediate class of construction and crowd out this semifireproof stuff. If this is the result, which we are confident will be the case, there will be a wider market for structural shapes.

V. G. IDEN

Secretary,
American Institute of Steel Construction,
New York.

Industry Must Sell Itself

To the Editor:

Needless to say, we, as an organization engaged in the work of public relations, greatly appreciate the understanding editorial in your issue of Feb. 21. (This referred to the importance to industry of good public relations.)

It has been gratifying to us to note the growth in the acceptance of our profession over the past ten years. As you indicate in your editorial, it is a rather strange fact that some of the industrial companies in this country which have been most active and most skillful in the merchandising of their products have failed most woefully in the merchandising of their own organization.

This situation, however, is gradually changing. The change is becoming more rapid because of the necessity for business to protect itself against attacks from two major sources, that is, labor and government. These forces have not neglected doing their best to sway public opinion. It is a rather melancholy fact that the attacks on business have hurt the attackers just as much as business has been harmed. After all, we are all in the same boat and all dependent upon business prosperity for our own well-being.

If we were to add an observation to the very well written editorial in your Feb. 21 issue, it would be to the effect that no public relations executive or organization can do a good job for an industrial concern unless the company itself is honest and sincere in its policies. Given this honesty and sincerity, however, as a background, proper handling of public relations will not only result in public confidence in the organization and its products but will also build internal loyalty. In the long run this increases profits, but what is of even broader importance it also contributes to the general stability of business by increasing public confidence in our commercial organizations.

J. EDWARD SCHIPPER

President,
Schipper Associates,
Detroit.

Better Things Ahead

To the Editor:

If a railroad man can see a bright future through the cloud of difficulties that surround his industry the rest of us should be optimists. In a recent address before the Western Railway club at Chicago, Col. C. D. Young, vice president in charge of purchases, stores and insurance of the Pennsylvania railroad, closed with the following inspiring outlook, which I am passing along with the idea it will help some of your readers see the brighter side. Col. Young said:

"The success of the automotive industry, competing as it does with rail transportation, is an outstanding example of the reward which is ready for an industry having a product filling a public need, when that industry exerts every pound of effort it possesses to develop the product as the public wants it developed.

"An industry may take the position that it knows better than the people what they want or need. You have seen industries of that kind and you have seen the inevitable results. The public is still able to decide what it wants. Industry's problem is to find what those wants are and ways and means to supply them. If that is done the rewards are waiting.

"Now, as to the future. Certain fundamentals are clear. The population of the United States is still increasing. Human nature is about the same. The people are willing to pay for a service or a product they

(*Please turn to Page* 115)

ZIRCONIUM added to Steel in the Ladle

. . . Inhibits Carbon Segregation

ZIRCONIUM added to open hearth steel in the ladle diminishes the variation in carbon content within the ingot. This variation, known as "segregation", results in non-uniform physical properties. Zirconium, by inhibiting carbon segregation, produces more uniform grain structure and properties throughout the ingot.

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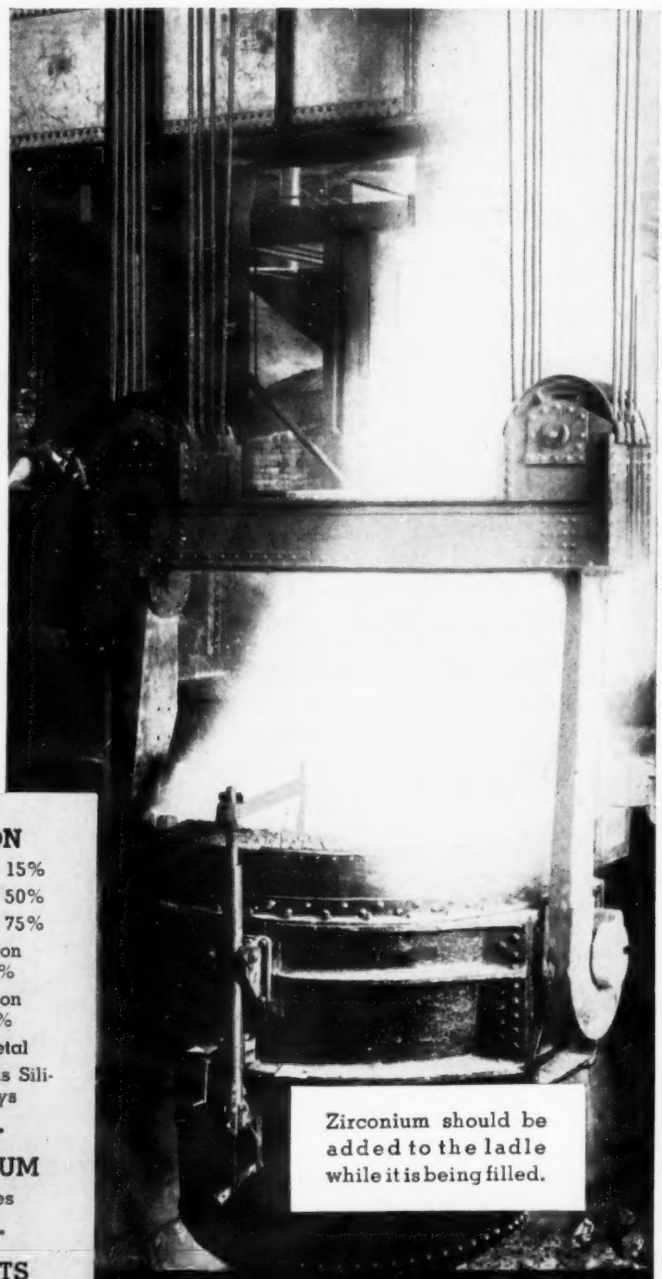

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STEEL

FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

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PRODUCTION · PROCESSING · DISTRIBUTION · USE

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As the Editor Views the News

■ METAL producing and metalworking companies will operate close to the profit line in 1938, a year in which foresight and aggressiveness will mean the difference between profit and loss. Capable managements will employ efficiency measures to offset high costs of labor, materials and supplies. More study undoubtedly will be devoted to customers' needs and the competitive situation. Such is the consensus now prevailing (p. 25) in well-informed minds in the steel industry. Steel production, it is expected, will average about 50 per cent for the year. . . . Barring unpredictable political "pump priming", the congressional election this fall is not expected to provide any notable uplift to business. STEEL shows congressional elections in the past 20 years have failed to stimulate business.

• • •

Steel in Used Car Drive

National used car exchange week was inaugurated last Saturday in a blaze of publicity which is to continue undiminished until the close of business March 12. During this 8-day period (p. 37) the automobile industry will spend $1,250,000 on advertising. Purpose is the sale of the 600,000 to 800,000 used cars now in dealers' hands. By clearing up this congestion the industry hopes to pave the way for increased production and sale of new cars. Heads of four large steel companies (p. 26) say all industry will benefit from this drive. . . . While there was little let-down from December to January in the number of steel company employes, hours (p. 27) averaged only 22.9 per week, lowest level since September of 1934.

• • •

South Makes Tin Plate

Formally placed in operation last week (p. 29) was Tennessee Coal, Iron & Railroad Co.'s new tin plate mill, the first in the South. It has capacity for 200,000 gross tons per year and its raw material is cold reduced strip from the company's new continuous mill. . . . A new type of steel construction known as the T & L design is being used for the first time (p. 35) in three apartment buildings in New York. Instead of the usual H-column, T and L columns are used; these are embedded completely in the exterior walls and interior partitions. . . . At New York (p. 27) the Steel Export association is working out quotas with various interested producers for effective participation by American mills with the International Steel Cartel.

• • •

Demonstrate Tool Progress

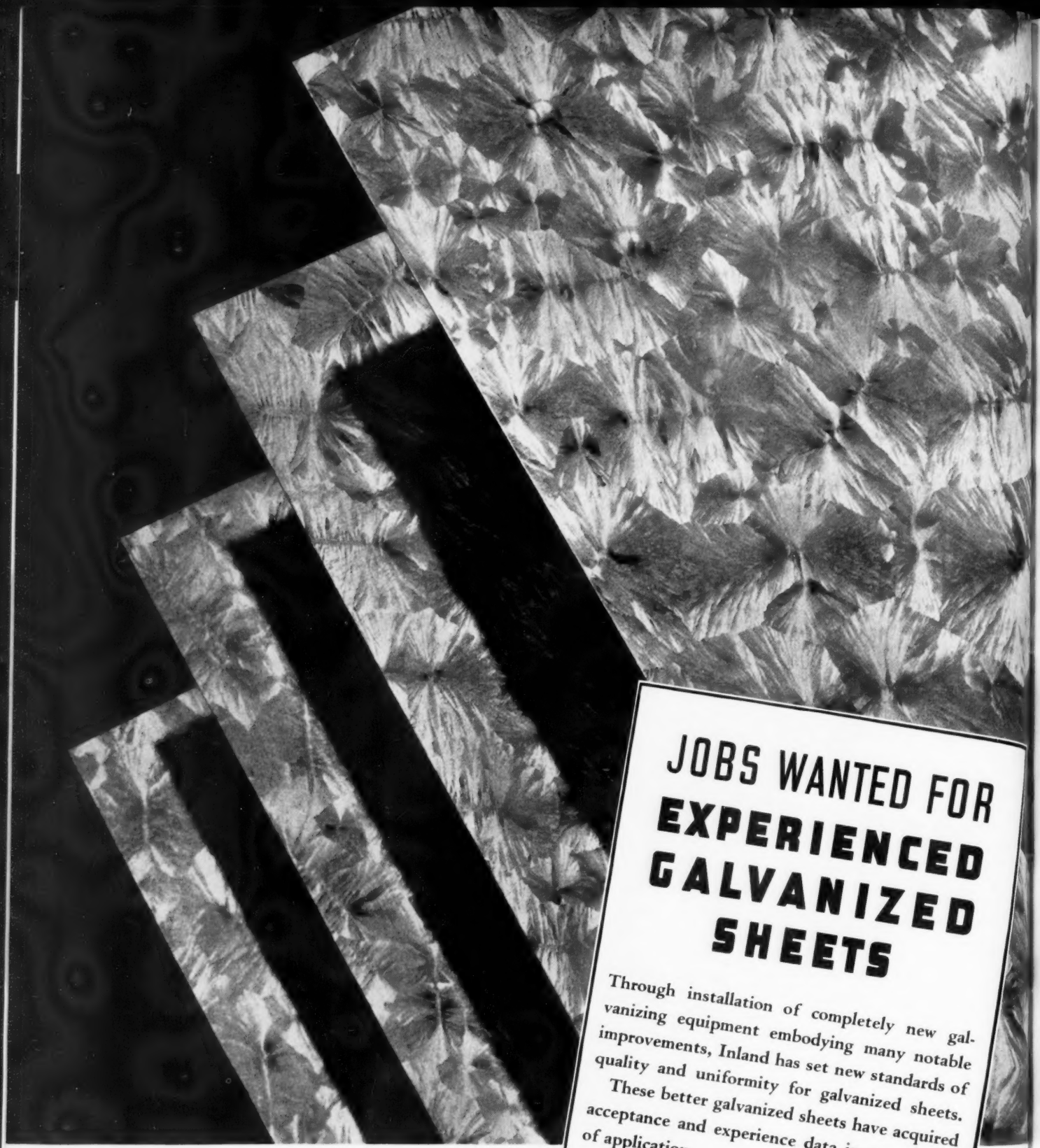
The machine tool show held in Cleveland in September of 1935 under the auspices of the National Machine Tool Builders' association proved a potent stimulant of the demand for modern machine tools and allied equipment. High hopes are held that the Machine and Tool Progress exhibition, to be held in Detroit this week (p. 46), will be followed by a reversal of the present downward curve. Nearly 150 manufacturers will show their products and the event has been timed to precede the start of most 1938 tooling programs. Sponsoring the exhibition is the American Society of Tool Engineers which on this occasion will hold its first annual convention. Large attendance is promised from the 17 cities in which this society now has chapters.

• • •

Speedier Handling

Modernization of materials handling systems in old buildings is not always as difficult as generally believed. At one old plant (p. 55) speedier and more economical handling has been brought about with no disruption of work schedules during the changeover. . . . A new self-fluxing method of brazing has been developed; the gas used as fuel (p. 58) is impregnated with flux in vapor form. . . . Several recent developments (p. 62) give improved results in bright annealing of nonferrous metals. . . . Prefabrication of welded steel houses is given impetus by establishment of a new plant (p. 71) devoted to this purpose. . . . A new device (p. 80) is said to end the old problem of under-door drafts; made of steel, it is furnished in a variety of finishes.

E. L. Shaner



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Politics Aside, It's a Year for Aggressive Action; What Steelmakers Expect

■ HOW MUCH can business depend on a national election for a lift? This being a congressional year, the assumption is the administration will "prime the pump" as fall approaches, to stimulate business, to gain votes.

If the record of the past 20 years counts for anything, however, nothing substantial may be expected from the mere fact of an election this fall—unless it means victory for the right candidates.

Precedent indicates business rises rather sharply in a Presidential year, but little for a congressional campaign. Strong pressure on congress for relief from many ills which inflict business may upset tradition. Also, when a party in power feels itself slipping it may put forth extraordinary efforts to retain its grip.

Study of daily ingot production in the past two decades, including five congressional elections, five Presidential elections and nine "off years" (1919 omitted because the steel strike late that year disrupted production) reveals:

A seasonal increase in the spring and a summer lull.

A definite upturn in the months preceding Presidential elections. A slight gain before congressional elections.

No increase in the fall months of the non-election years. The composite trends are shown in the accompanying charts.

1938 Starts Below Average

In the five congressional years, slight improvement was noted in 1918 (war time), 1922 and 1926. In 1930 and 1934 production was low in the months preceding elections.

Each of the past five Presidential years indicates some stimulus prior to the election. Weak in 1932, the uplift was marked in 1920, 1924, 1928 and 1936.

Daily average ingot production in January, 1938, was about 66,625 tons, compared with an average of 119,606 tons for that month in the past 20 years. Daily average output in February was about 69,768 tons, compared with an average of 128,193 tons in February for the past 20 years.

What government could do to encourage business has been told many times. Many economists have pointed out that the trouble is political, not economic; that it lies in the relationship between government and business.

Troubles Political, Not Economic

Col. Leonard P. Ayres, vice president, Cleveland Trust Co., recently summed up the situation:

"We have all the economic requisites for prosperity. We have the men, money, materials and markets. Our troubles are political, not economic. Probably no nation stricken by the depression ever before faced a recovery problem so simple in its economic terms, so complex in its political terms. Our fundamental trouble is that as a nation we have been trying too long to substitute an artificial recovery for a natural recovery."

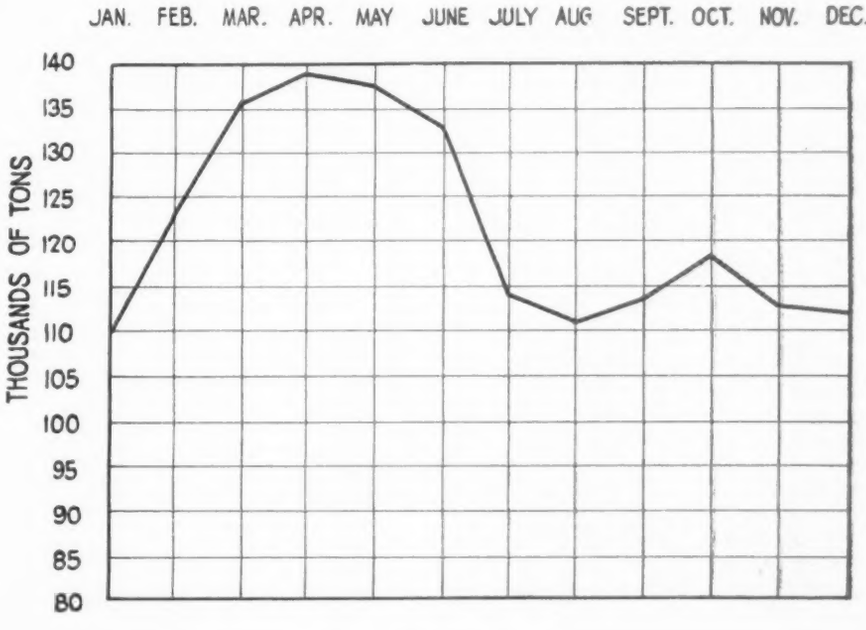
If the administration would adopt a policy—fair to capital and labor alike—and adhere to that policy, many economists believe much of the current uncertainty would disappear.

But here is the difficulty, they point out: To be effective such a policy must of necessity involve an about-face on the administration's "pet" plans, repeal or modification of the tax on undistributed profits; modification of the Wagner act; cessation of persecution of business; encouragement of investment in private enterprise. Anything short of this would be considered a temporary expedient. The chief hope is that congress itself will take the lead in the emergency toward initiating business-building legislation.

Although business analysts, peering through the political fog, express widely varying views regarding the steel industry for 1938, the composite opinion held by steelmakers is this: Operations are ex-

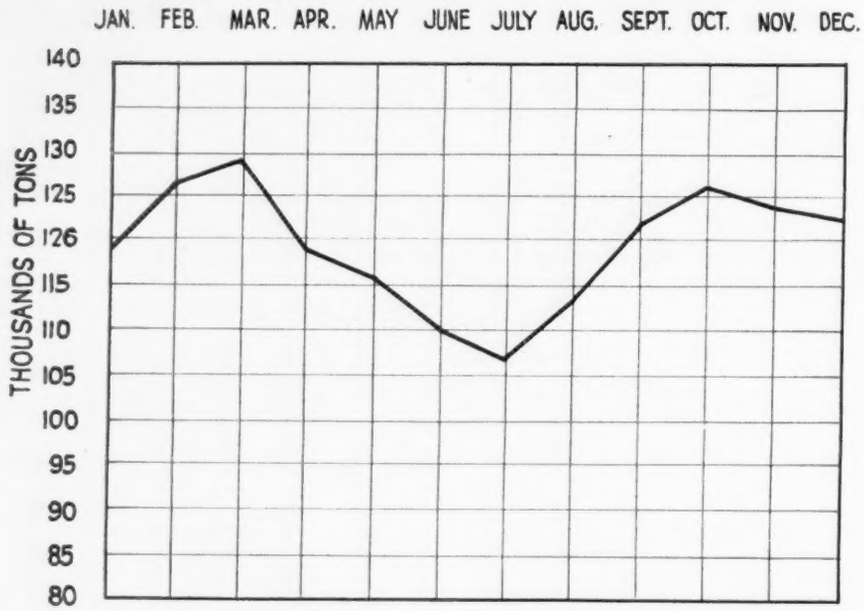
Steel Curve Composite, Five Congressional Years

(Daily average ingot production, 1918, 1922, 1926, 1930, 1934.)



Steel Curve Composite, Five Presidential Years

(Daily average ingot production, 1920, 1924, 1928, 1932, 1936.)



pected to advance moderately in March and April, going to 45 to 50 per cent in May; following a summer lull, an upturn to about 60 per cent in some of the fall months. The consensus is that 1938 will be a 50 per cent year in steel, though some observers say "40". This compares with 72.3 per cent in 1937.

While the appraisal may be all upset by the turn of the political wheel, present circumstances indicate the majority of companies in the steel and metalworking industries will operate close to the profit line; that it will be a year in which business foresight, organization and aggressiveness will mean the difference between profit and loss.

A keenly competitive situation is developing; management will introduce the greatest possible measures of efficiency to offset high costs of labor, material and supplies. Sales campaigns will be studied and based largely on the cost motif. Manufacturers will devote more time to studying customers' needs, and competitive situations.

Summarized, outlook in the leading steel consuming lines is as follows:

RAILROADS, with 7,500,000 tons of deferred steel buying (as reported in STEEL, Feb. 28, p. 17), probably will receive another freight rate increase soon. This will be at least partially offset by the recent decrease in carloadings. Result is uncertain. Net operating income of railroads in January was the lowest for any month since February, 1921.

J. M. Davis, president, Delaware, Lackawanna & Western railroad, says: "The carriers will spend a billion dollars annually for the next several years if the increase (15 per cent) is granted."

AUTOMOTIVE industry depending on movement of used cars and re-establishment of consumer purchasing power. Here is where administration "pump priming" would have a definitely beneficial effect.

BUILDING still handicapped by labor and other restrictions, and generally uncertain.

AGRICULTURE, sustained cash income of farmers as compared with a year ago aids the outlook for relatively heavy sales of farm equipment, though some decrease in the year's business from the record 1937 volume is considered probable.

CONTAINERS probably will have a good year. Now above 50 per cent, tin plate operations are expected to increase as crop prospects materialize.

OIL AND GAS, new wells probably will be drilled despite diminished automobile production, observers in the industry report. Additional pipe line capacity is needed, but will be built only if financing can be arranged.

SHIPBUILDING now under way will continue to take substantial tonnages. A large navy program will help in the long pull, but will be slow in developing.

MISCELLANEOUS consumer goods industries await re-establishment of purchasing power. These also would be benefited by "pump priming."

Steel Leaders in Used Car Week

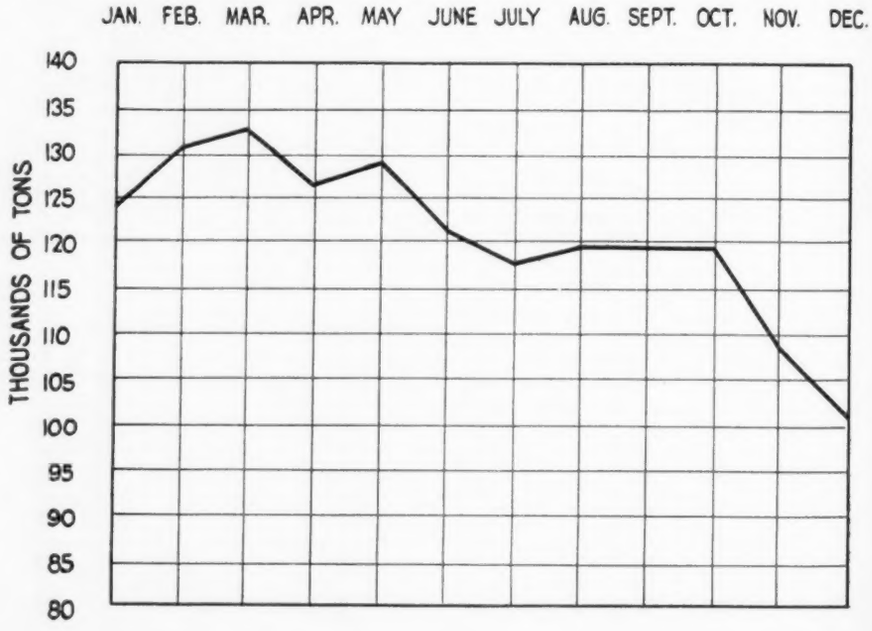
DETROIT

■ CHIEFS of the nation's three largest steel producing corporations have united in indorsing national used car exchange week and in predicting the automobile industry's program to stimulate industrial activity will be successful. The campaign started March 5.

Spokesmen for the steel corpora-

Steel Curve Composite, Nine Non-Election Years

(Daily average ingot production, 1921, 1923, 1925, 1927, 1929, 1931, 1933, 1935, 1937.)



tions were Myron C. Taylor, chairman, United States Steel; E. G. Grace, president, Bethlehem Steel, and T. M. Girdler, chairman, Republic Steel.

Declaring unemployment the nation's most pressing problem today and "any plan that has for its purpose the providing of jobs should be encouraged," Mr. Taylor said:

"Fully realizing the basic importance of transportation in all its forms, and also the crying need to provide work for idle men and women, it cannot be questioned that an increased demand for new vehicles would immediately spring up if a substantial number of used cars could be sold.

"All these related industries—and there are many—which combine to produce the nation's automobiles would benefit from the revival of demand, as would all the productive and distributive groups."

Mr. Grace declared the program "a constructive effort with far-reaching potential benefits." He added:

"It is encouraging that in the present period of hesitation a nation-wide co-operative effort is being made to bring the values now available in used cars to the attention of the public with the immediate objective of assisting dealers to reduce inventories."

Predicting that the movement would "remove one definite barrier to general business recovery," Mr. Girdler said:

"Automobile values unmatched since the event of today's low-priced efficient cars are a focal point in the present drive to break a log-jam paralyzing business.

"It is a buyer's market in used cars offering millions of miles of low-cost motoring to those who recognize it. Efforts to awaken a general appreciation of these opportunities are more than mere bids for sales dollars. They attack basic problems which will open up the way for a resumption of activity in the automotive industry and other industries which look to it for business."

Charles R. Hook, president of the National Association of Manufacturers, and president, American Rolling Mill Co., stated:

"The drive to thrust aside barriers which are blocking the normal production of new cars should be of tremendous help in opening up the avenue to general business recovery and re-employment."

(See also Mirrors of Motordom, p. 37.)

WEIR GIVES PRESIDENT "FACTS AND FIGURES"

The business situation was discussed last week by Ernest T. Weir, chairman, National Steel Corp., with President Roosevelt. Mr. Weir told newsmen he had turned over certain facts and figures to the President.

"Business is running along about the same," he said, following the conference. "I see no improvement although I hope the bottom has been reached."

Number on Payroll Holds Up, but Hours Are Shortest since 1934

■ AVERAGE work week for steel wage earners dropped to 22.9 hours in January, lowest since September, 1934 when it was 22.6 hours, according to American Iron and Steel institute figures. Total number of employes continues to hold up remarkably well considering the low rate of operations and reflects the extent to which employers have adopted a program to spread employment as far as possible.

January employment averaged 475,000, 6.5 per cent less than the 508,000 employed in December, and 21 per cent less than the all-time high, 603,000 in August, 1937.

Since August production has dropped 65 per cent. Payrolls have declined less than 49 per cent, from $92,663,000 to $47,578,000. January payrolls were 8.6 per cent below the December total of $52,578,000.

Hourly earnings of wage-earning employes averaged 80.5 cents per hour in January, against 81.7 cents in December and 72.5 cents in January, 1937.

Steel employment and payroll data for 1937 and January, 1938:

		Ingot Output Gross Tons	Number of Employes	Total Payrolls	Average Hourly Wages	Average Hours Per Week
1937	Jan.	4,724,939	547,997	$76,423,054	72.5	40.5
	Feb.	4,413,832	556,077	74,277,665	72.8	42.5
	March	5,216,666	577,050	90,863,016	79.3	42.5
	April	5,071,875	589,351	94,321,859	85.6	41.3
	May	5,153,559	595,354	92,931,305	86.6	38.6
	June	4,183,762	555,743	87,519,613	87.7	39.2
	July	4,556,596	593,906	90.549,660	86.8	37.3
	Aug.	4,875,671	603,106	92,663,389	86.1	37.9
	Sept.	4,301,869	602,729	86,160,875	84.3	36.8
	Oct.	3,392,691	586,644	76,191,149	83.1	31.9
	Nov.	2,153,781	551,158	62,119,455	82.1	27.6
	Dec.	1,472,241	508,000	52,062,000	81.7	23.4
1938	Jan.	1,732,266	475,000	47,578,000	80.5	22.9

Moving Slowly With Cartel Plan

■ NEGOTIATIONS among producers in their effort to work out an export arrangement with the European steel cartel embodying a wide range of basic products are progressing slowly, with some well-formed interests indicating conferences may be necessary for another two months or more to draw up a comprehensive and satisfactory arrangement.

These conferences have been going on ever since the visit of the cartel's delegation early in February, and have been under the general direction of the Steel Export association, 75 Wall street, New York. As previously reported in STEEL, Feb. 7, p. 26, and Feb. 21, p. 21, plates, shapes, bars, sheets, strip, hoops and bands and wire products and some semifinished steel products are included.

Up to this time, only American tin plate and pipe have figured in an international arrangement, although pipe has never been fully "cartelized."

Viewpoints Vary

There are not only various viewpoints to reconcile, but there are varying degrees of interest. For this reason it is difficult to estimate capacity represented.

Cartel agreements not infrequently run three years, and in present negotiations periods of three and five years are considered.

The basis for establishment of quotas among domestic producers has varied. A distribution of quotas on a basis of shipments in 1936 was said to have been originally proposed. Then later a certain period last year was tentatively discussed as a basis.

Indications are some producers who have been more or less interested in export business over recent months will not participate; however, if a substantial percentage of this country's capacity can be lined up, it is believed a program could be arranged.

Foreign cartel prices on many products are lower than a year ago, but on tin plate, of special interest to American exporters, there has been little change.

William B. Todd, former vice president in charge of sales, Jones & Laughlin Steel Corp., will sail shortly to represent the Steel Export association in London. He will be accompanied by John Outwater, the association's foreign representative several years, who will familiarize Todd with his duties and then return to an executive position with the association in New York.

February Iron Production Gains Slightly; One More Stack Active

■ FURTHER indication that the bottom of pig iron production for the current recession has been reached is afforded in the statistics for February which show an extremely small increase in daily output and a one stack gain in active blast furnaces. These improvements, as small as they are, nevertheless record the first uplift since the drastic curtailment in output which began last September. January, it is to be recalled, had registered by far the smallest losses during the five-month drop and suggested that the decline had been arrested.

Average daily production of coke pig iron in the United States during February was 46,655 gross tons, an increase of 47 tons, or 0.1 per cent, over the January daily rate of 46,608 tons. This was the first increase since August, 1937. The rate was the smallest for February in any year since 1934 when the rate was 45,385 tons. Daily output in February, 1937, was 107,857 tons.

MONTHLY IRON PRODUCTION
Gross Tons

	1938	1937	1936
Jan.	1,444,862	3,219,741	2,029,304
Feb.	1,306,333	3,020,006	1,838,932
Tot. 2 mo.	2,751,195	6,239,747	3,868,236
March		3,470,470	2,046,121
April		3,400,636	2,409,474
May		3,545,180	2,659,643
June		3,115,302	2,596,528
July		3,501,359	2,595,791
Aug.		3,616,954	2,711,726
Sept.		3,417,960	2,728,257
Oct.		2,891,026	2,991,794
Nov.		2,007,031	2,949,942
Dec.		1,503,474	3,125,192
Total		36,709,139	30,682,704

Total production in February amounted to 1,306,333 gross tons, which, compared to the 1,444,862 tons made in January, represented a decrease of 138,529 tons, or 9.6 per cent. February was a three-day shorter month than January. The total was the smallest since December, 1934, with 1,028,006 tons and constituted the poorest February showing since 1934 when 1,270,792 tons were produced. February, one year ago, output was 3,020,006 tons.

Total production for the first two months of 1938 aggregates 2,751,195 gross tons compared with 6,239,747 tons for the corresponding period in 1938, a reduction of 3,488,552 tons, or 55.9 per cent. First two months in 1936 gave a total of 3,868,236 tons.

The operations figure, relating production to capacity, was 33.6 per cent in February, the same as for January. This rate compares with 35.6 per cent for December, 49.3 for November and 68.4 for October and was the lowest since December, 1934, with 23.7 per cent. February of last year averaged 79.5 per cent.

AVERAGE DAILY PRODUCTION
Gross Tons

	1938	1937	1936	1935
Jan.	46,608	103,863	65,461	47,692
Feb.	46,655	107,857	63,411	57,675
March		111,951	66,004	57,120
April		113,354	80,316	55,719
May		114,360	85,795	55,986
June		103,843	86,551	51,949
July		112,947	83,735	49,043
Aug.		116,676	87,475	56,767
Sept.		113,932	90,942	59,009
Oct.		93,259	96,509	63,818
Nov.		66,901	98,331	68,876
Dec.		48,499	100,813	68,242
Ave.		100,573	83,832	57,694

Active blast furnaces on Feb. 28 totaled 92, a gain of one furnace over the 91 in operation Jan. 31. This was the lowest for any February since 1934 with 90. The increase in operating units was the first since the decline began last August.

During February, 5 steelworks or nonmerchant stacks resumed operation while 2 were blown out or banked, making a net increase of 3 for this class. Of the merchant units, 2 were taken out and none added.

Stacks blowing out or banking during February were: In Ohio: Lorain No. 5, National Tube Co. In Pennsylvania: Brooke, E. & G. Brooke Iron Co.; Palmerton No. 1, New Jersey Zinc Co. In Alabama: Ensley No. 6, Tennessee Coal, Iron & Railroad Co.

Furnaces going in were: In Ohio: Trumbull Cliffs, Trumbull Cliffs Furnace Co.; Youngstown No. 2, Republic Steel Corp.; Portsmouth, Wheeling Steel Corp. In Alabama: Ensley Nos. 1 and 2, Tennessee Coal, Iron & Railroad Co.

FEBRUARY IRON PRODUCTION

	No. in blast last day of Feb.	Jan.	Total tonnage Merchant	Nonmerchant
Ohio	21	19	39,141	248,325
Penna.	27	29	39,516*	325,738*
Alabama	13	12	66,496*	79,812*
Illinois	6	6	50,130	61,956
New York	7	7	38,209	53,044
Colorado	1	1		
Indiana	7	7	4,613	218,930
Maryland	4	4		
Virginia	0	0		
Kentucky	1	1		
Mass.	0	0		
Tenn.	0	0		
Utah	1	1	9,751	70,672
West Va.	1	1		
Michigan	2	2		
Minnesota	1	1		
Missouri	0	0		
Total	92	91	247,856*	1,058,477*

*Includes ferro and spiegeleisen.

Industrial Leaders In Welfare Work

■ Leaders in the metal industries have joined other citizens of New York in a program for financing and co-ordinating more than 800 private health and welfare agencies. A campaign for $10,000,000 in contributions from business firms and employes will begin May 2. It is aimed to do away with overlapping service and attain greater correlation of health and welfare activities.

Among members of the sponsoring committee are: Myron C. Taylor, chairman, United States Steel Corp.; Edward R. Stettinius Jr., chairman of finance committee, United States Steel Corp.; Charles M. Schwab, chairman, Bethlehem Steel Corp.; Max Schott, president, Climax-Molybdenum Co.; Ivan Reitler, president, Federated Metals Corp.; Walter P. Jacob, president, General Bronze Corp., Long Island City, N. Y.; Oscar C. Huffman, president, Continental Can Co. Inc.; Harold K. Hochschild, president, American Metal Co.

RATE OF OPERATION
(Relation of Production to Capacity)

	1938[1]	1937[2]	1936[3]	1935[4]
Jan.	33.6	76.6	48.2	34.2
Feb.	33.6	79.5	46.4	41.4
March	....	82.5	48.5	41.0
April	....	83.7	59.1	40.0
May	....	84.3	63.1	40.2
June	....	76.6	63.6	37.2
July	....	82.9	61.5	35.2
Aug.	....	85.7	64.3	40.7
Sept.	....	83.7	66.9	42.5
Oct.	....	68.4	71.0	45.8
Nov.	....	49.3	72.3	49.5
Dec.	....	35.6	74.2	49.0

[1] Based on capacity of 50,606,400 gross tons, Dec. 31, 1937; [2] first half on capacity of 49,512,737 tons, Dec. 31, 1936—second half on capacity of 49,727,737 tons, June 30, 1937; [3] capacity of 49,777,893 tons, Dec. 31, 1935; [4] capacity of 50,845,741 tons, Dec. 31, 1934. Capacities by American Iron and Steel Institute.

■ Virginia Iron, Coal & Coke Co., Roanoke, Va., reports a net loss for the year 1937, excluding subsidiaries, of $88,272. In the preceding year a loss of $88,404 was reported In its consolidated report including subsidiaries, net loss for 1937 is placed at $91,175 compared with $91,950 in 1936.

Tennessee Coal, Iron & Railroad Co.'s new mill in the Birmingham district covers 22 acres, took 25,000 tons of structural steel. In foreground, workers' bath-house and mill office buildings under construction.

Tin Plate Made for First Time in South; Tennessee's Mill Operating

BIRMINGHAM, ALA.

■ SEVENTEEN months ago—Oct. 15, 1936—Myron C. Taylor, chairman, United States Steel Corp., announced in Birmingham the corporation's plan to build here a tin plate mill, first in the South. Last week press representatives saw the $29,000,000 mill in operation for the first time.

The plant adjoins the Tennessee Coal, Iron & Railroad Co.'s plate and sheet mills and open hearths. It will have annual capacity for 200,000 gross tons of tin plate.

Black plate for tinning is obtained in coils from a new continuous, wide strip mill, having annual capacity for 300,000 tons.

Two units of cold reduction mills are provided, each consisting of five stands of 4-high mills set in tandem with a tension reel following the finishing stand. The delivery speed is adjustable from 700 to 1600 feet a minute. There are eight shearing lines, each consisting of an uncoiler, rotary shear and flying shear.

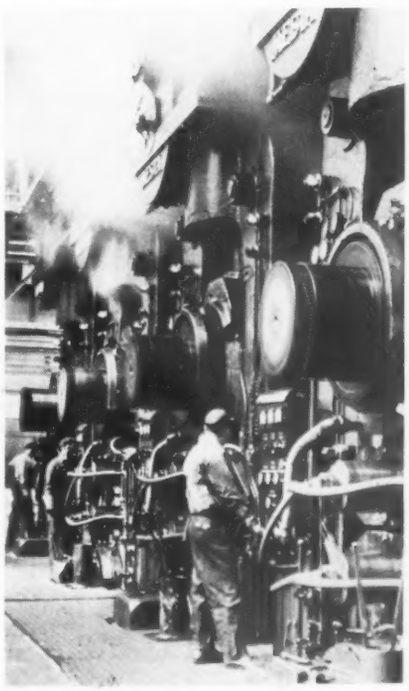
In the continuous pickling two units are provided, each consisting of uncoiler, stitcher, hot sulphuric acid tank, rinse tank, pinch roll, shear and coiler. Each pickling line is 500 feet end to end.

The plant will provide work for about 3000 in addition to normal employment of 17,000 in other Tennessee company's mills. Several hundred women will be employed in the sorting and inspection departments.

The mill gives the company a back-log or improved load factor, which is expected to improve conditions during seasonal variations in business, as well as in times of depression, production requirements of tin plate generally being uniform.

FIRST MILL TESTED IN NEW IRVIN WORKS

First machinery in operation at Carnegie-Illinois Steel Corp.'s new Irvin sheet, strip and tin plate plant near Clairton, Pa., is a 42-inch five-stand tandem type mill in the cold reduction department.



One of the 5-stand, 42-inch tandem cold mills which serve Tennessee's new tin plate mill

The mill was given its first rolling test March 2, nine months after excavation started.

All plant equipment is expected to be installed for test operations by July 1.

Ginger Ale in Cans May Be Tin Plate Outlet

■ A new outlet for tin plate is indicated in a test merchandising program for the sale of ginger ale in cans which is being conducted in New York and Boston. Should the trial prove successful, a sizable amount of tin plate is expected to be used.

This test comes after three years of private experimentation by Cliquot Club Co. The can used is a 12-ounce container with short neck and cap, manufactured by the Continental Can Co., New York. It is said to be similar in detail to the 12-ounce beer can produced by this company, with exception of lining.

Palm Oil Residue Would Become Tax Exempt

■ As the new revenue bill was reported last week by the house ways and means committee, a special section was inserted dealing with palm oil residue.

The act of 1934 imposes a tax upon the first domestic processing of certain oils, but does not include palm oil used in manufacturing tin or terne plate. From the residue remaining after the use of the oil for such purposes lubricating grease is manufactured, and it has been held that the use of this palm oil residue is subject to the processing tax. The tax is heavy in proportion to the market value of the grease manufactured. The amendment exempts the residue remaining from tin and terne plate.

January Imports Gain 17 Per Cent

■ IMPORTS of steel and iron products in January totaled 29,409 gross tons, valued at $1,680,955, up 17.1 per cent in quantity and 7.2 per cent in value from the 25,104 tons valued at $1,568,033 in December, according to the metals and minerals division, department of commerce.

Compared with the 1937 monthly average of 37,627 tons valued at $2,041,316 January imports declined 21.8 per cent in volume and 17.6 per cent in value. In comparison with receipts in January, 1936, of 40,642 tons valued at $1,716,324 the initial month this year registered a loss of 27.6 per cent in volume and 2.1 per cent in value.

The largest increase in January imports was in barbed wire, which was 2653 tons over the December figure, and steel pipe, 2177 tons more than in December. Steel bars dropped 648 tons.

Pig iron was the leading product imported, 9747 tons, compared with 9128 tons in December and 12,434 tons in January, 1937. British India sent 5491 tons and the Netherlands 4160 tons.

Germany provided the largest tonnage with 8717 tons, compared with 3907 tons in December and 3063 tons in January, 1937. Belgium was second with 6894 tons against 7134 tons in December.

Imports of scrap were at the lowest level in several months with 222 tons, valued at $6632. In December scrap imports were 688 tons valued at $13,186 and in January, 1937, they were 2421 tons valued at $35,517.

FOREIGN TRADE OF UNITED STATES IN IRON AND STEEL

Gross Tons

	1938		1937	
	Exports	Imports	Exports	Imports
Jan.	586,102	29,631	201,692	43,063
Feb.	.....	.....	290,987	41,628
March	.....	.....	570,584	51,805
April	.....	.....	683,674	68,197
May	.....	.....	969,222	49,050
June	.....	.....	826,534	44,771
July	.....	.....	889,438	47,012
Aug.	.....	.....	836,319	61,489
Sept.	.....	.....	543,740	37,071
Oct.	.....	.....	522,611	37,186
Nov.	.....	.....	556,591	26,996
Dec.	.....	.....	626,418	25,792
Total	.....	.....	7,567,884	533,160

ORIGIN OF JANUARY IMPORTS

Gross Tons

	Iron ore	Pig iron	Manganese ore	Ferromanganese
Norway	12,882	.....	.....	597
United Kingdom	42	.....	.....	.....
Yugoslavia	55	.....	.....	.....
Canada	5	96	.....	.....
Cuba	11,000	.....	4,348	.....
Chile	140,600	.....	.....	.....
Iran	4,135	.....	.....	.....
Netherlands	.....	4,160	.....	.....
British India	.....	5,491	.....	.....
Soviet Russia	.....	.....	9,261	.....
Brit. W. Africa	.....	.....	2,244	.....
Philippine Isl.	.....	.....	1,601	.....
France	.....	.....	.....	50
Total	168,719	9,747	17,454	647

	Sheets, skelp and sawplate	Structural steel	Steel bars	Hoops and bands
Belgium	420	2,522	1,267	2,019
United Kingdom	1	.....	40	.....
France	.....	529	55	123
Germany	.....	96	140	33
Austria	.....	.....	4	.....
Sweden	.....	.....	382	2
Total	421	3,147	1,888	2,177

U. S. IMPORTS FOR CONSUMPTION OF IRON AND STEEL PRODUCTS

Gross Tons

Articles	Jan. 1938	Dec. 1937	Jan. 1937
Pig iron	9,747	9,128	12,434
Sponge iron	11	237	279
Ferromanganese (1)	647	399	2,370
Spiegeleisen	125	341	660
Ferrochrome (2)	20	.....	53
Ferrosilicon (3)	56	57	114
Other ferroalloys (4)	1	.....	2
Steel ingots, blooms, etc	.....	.....	109
Billets	233	223	51
Concrete reinforc. bars	45	85	722
Hollow bar, drill steel	125	191	164
Bars, solid or hollow	1,854	2,462	5,104
Iron slabs	.....	.....	.....
Iron bars	10	93	137
Wire rods	504	634	1,626
Boiler, other plate	4	.....	20
Sheets, skelp, saw plate	421	258	1,496
Die blocks or blanks	3	1	2
Tin plate, taggers' tin and terne plate	1	15	41
Structural shapes	3,147	3,396	7,919
Sashes and frames	.....	.....	.....
Sheet piling	.....	99	1
Rails and fastenings	184	166	180
Cast iron pipe, fittings	201	39	177
Malleable iron pipe fittings	11	.....	29
Welded pipe	301	748	249
Other pipe	4,760	2,136	475
Cotton ties	19	.....	.....
Other hoops, bands	2,177	1,878	2,141
Barbed wire	3,242	589	1,585
Round iron, steel wire	73	484	325
Telegraph, telephone wire	.....	17	6
Flat wire and strips	263	262	282
Wire rope and strand	213	232	227
Other wire	259	65	278
Nails, tacks, staples	536	432	1,171
Bolts, nuts, rivets	12	9	24
Horse and mule shoes	31	.....	24
Castings and forgings	173	428	115
Total gross tons	29,409	25,104	40,642
Iron and steel scrap	222	688	2,421
GRAND TOTAL	29,631	25,792	43,063

(1) Manganese content; (2) chrome content; (3) silicon content; (4) alloy content.

Canadian Steel Imports Decline in January

■ Iron and steel imports into Canada in January were valued at $12,808,000, a slight decline from the total of $13,345,000 in January, 1937. Imports from the United States fell to $10,902,000 from $11,637,000 last year. Machinery was the most important item, at $2,579,000. Automobile parts aggregated $2,546,000, farm implements $1,352,000, automobiles $1,036,000, engines and boilers $598,000, plates and sheets $567,000, rolling mill products $483,000, castings and forgings $122,000, tubes and pipe $105,000 and tools $102,000.

Exports in January were valued at $5,565,000, compared with $4,655,000 in January, 1937.

FINANCIAL

BETHLEHEM'S 1937 NET $7.64 PER COMMON SHARE

■ BETHLEHEM STEEL CORP. reports sharp gains in almost every department of its business in its annual report to be presented to stockholders at the annual meeting in Wilmington, Del., April 12.

Net income for the year was $31,819,596, equal to $7.64 a common share, and compares with $13,901,006, equal to $2.09 a common share, in 1936.

Other comparisons: Operations averaged 77.7 per cent in 1937, against 64 per cent in 1936; shipments were $418,556,528, compared with $288,053,862 in the year before; bookings aggregated $388,336,129, against $337,729,073; daily average number of employes, 80,312, against 66,694; total wages, $169,697,351, against $120,285,916; average earnings, exclusive of sales and administration, 86 cents, compared with 72.1; common stock dividends, $5, against $1.50 in 1936.

Net billing value of unfilled orders on hand Dec. 31, 1937, declined to $93,470,063, compared with $123,690,462 on Dec. 31, 1936.

Cash Position Better

Cash position of the company improved, standing at $49,475,413 at the end of 1937, compared with $36,890,906 at the end of 1936.

Company's tax bill increased sharply. Including consolidated companies and its share of taxes of unconsolidated companies, this was $19,687,125, compared with $12,033,346 in 1936. The total included $4,995,785, for unemployment, old age, and railroad retirement taxes for 1937, compared with $1,317,812 for 1936.

Rated steel capacity was increased from 9,360,000 tons to 10,042,000 tons a year, effective Jan. 1. Rated pig iron and ferromanganese capacity rose from 6,375,000 tons to 6,588,000 tons.

Accompanying the report was a letter to stockholders from Charles M. Schwab, chairman, announcing the termination on Dec. 31, 1939 of the management stock ownership plan adopted in 1930, if the shareholders agree. Shares originally allotted totaled 221,200; on Jan. 1 purchase agreements covering 200,120 remained in effect, 450 having been paid in full and the balance canceled by death or termination of employment. Price originally set was $91.60 a share.

Participants may apply all payments made so far to the purchase of whatever number of shares can be covered by the resulting sum, or terminate the plan at the end of 1939 and all payments, without in-

terest, will be returned by the trustee.

New pension rulings to protect employes against losses under the social security act were announced in a report to employes. Where employes are entitled to larger pensions than they would receive under the social security act, the Bethlehem pension board will pay the difference.

The report to employes also points out the company has received $3,000,000,000 from sale of products in the past 12 years, and has paid 40 per cent of this to employes in wages. Using 1923 as 100, the company's hourly wage rates stand at 146, and the composite selling price of steel at 93.

SHEET & TUBE UNDERTAKES SHORT TERM FINANCING

Youngstown Sheet & Tube Co. has arranged bank borrowing totaling $12,500,000, of which $5,000,000 has been used to retire previous bank loans and the balance to strengthen the company's cash position.

A program of new financing was authorized by the shareholders last October. In its annual report to be issued shortly the company states:

"A favorable time for such new financing has not yet arrived . . . With the business outlook uncertain and the long term investment market unfavorable, your directors deem it wise to proceed with caution and also to take advantage of the opportunity to effect short-term financing on favorable terms so as to strengthen the company's cash position."

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In its annual pamphlet report for the 12 months ending Dec. 31 Sharon Steel Corp., Sharon, Pa., discloses net profit of $1,345,810, equivalent to $2.83 a share on common stock after requirements for dividends on the $5 preferred. Net income in 1936 of $1,272,246 was equal to $3.04 on about 10,000 fewer shares of common. Dividend disbursements during 1937 of $711,248, represented $1.25 paid each quarter on the convertible $5 preferred stock and a dividend of 30 cents in each quarter on the common stock. The corporation closed the year with no funded or floating debt. Taxes paid during the year amounted to $667,638.

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Wheeling Steel Corp., Wheeling, W. Va., reports net profit of $4,238,488 for the year ended Dec. 31, equal to $4.11 a share on 563,212 common shares outstanding. This compares with $4,115,388 or $4.71 a share in the preceding year. Flood losses of $1,189,659 were charged directly to earned surplus.

The company declared the regular quarterly dividend of $1.25 a share on the $5 preferred and $1.50 a share on the 6 per cent preferred stock. Both are payable April 1 to holders of record March 12.

District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended Mar. 5	Change	Same week 1937	Same week 1936
Pittsburgh ..	27	— 1	88	38
Chicago	26.5	+ 2	81	62
Eastern Pa...	30	None	57	39
Youngstown..	29	None	84	68
Wheeling	38	None	96	78
Cleveland ...	28	— 3	79.5	64
Buffalo	21	None	90	42
Birmingham..	58	— 3	77	66
New England	15	—12	97	68
Cincinnati ...	10	—25	64	76
St. Louis.....	28	None	82	†
Detroit	35	— 8	100	94
Average....	29.5	— 1	86	55.5

†Not reported.

CLIMAX MOLYBDENUM NET UP AS CAPACITY GROWS

Climax Molybdenum Co., New York, reports net profit for 1937 of $7,173,796 after all deductions except depletion of discovered increment. This is approximately $2.85 per share on 2,520,000 shares outstanding Dec. 31, 1937, and compares with net profit of $5,206,110 or $2.06 per share the previous year. A dividend of 30 cents per share, payable March 31 to record March 18 has been declared.

During 1935-6-7 total appropriations of $5,622,126 were made to increase production facilities to meet growing demand, said Max Schott, president. Unexpended appropriations at the end of 1937 were $563,015. While the construction program was not entirely completed in 1937, the increase in mine and mill capacity resulted in production of over 22,000,000 pounds of molybdenum in concentrates during 1937, about 50 per cent greater than 1936 and 120 per cent over 1935.

January Canadian Ingots Higher, Pig Iron Off

■ Production of steel ingots and castings in Canada in January amounted to 112,380 tons, compared with 98,334 tons in December, and 115,237 tons in January, 1937. January tonnage consisted of 107,860 tons of ingots and 4520 tons of castings.

January output of pig iron was 74,862 tons, compared with 81,032 tons in December and 66,400 tons in January, 1937. Ferroalloy production was 5497 tons in January, 5846 tons in December, and 6519 tons in January of last year.

PRODUCTION

■ STEEL production last week dropped 1 point to 29.5 per cent. Five steelmaking centers held to their rates of the preceding week and six decreased their capacity slightly. Chicago was the only one showing an increase.

Youngstown—For the third consecutive week steel production remains at 29 per cent and the outlook for this week indicates no change. Active furnaces included 29 open hearths, two bessemer converters and eight stacks.

St. Louis—Unchanged at 28 per cent for third consecutive week. Expectations indicate continuance for this week.

Birmingham, Ala.—Down 3 points to 58 per cent following extinguishing of one open hearth at Gadsden, Ala.

Central eastern seaboard—Rate continues at 30 per cent.

Cincinnati—Staggered production brought operation down 25 points to 10 per cent last week. Return to about 30 per cent is scheduled for this week.

New England—Withdrawal of all open hearths by the leading interest cut the rate 12 points, to 15 per cent. Only one maker is producing ingots in this district.

Pittsburgh—Declined 1 point to 27 per cent, with indication of no change this week.

Wheeling—Stationary at 38 per cent, with the same rate scheduled for this week.

Detroit — Two open hearths dropped brought this operating rate down 8 points to 35 per cent. Active open hearths now under 7 out of 21.

Chicago—Increased 2 points to 26.5 per cent, the best rate in five weeks. This resulted from additional furnace activity by one interest, which may be only temporary. Return of a banked blast furnace to activity gives 13 stacks active out of 39.

Buffalo—Steady at 21 per cent, with 9 out of 43 open hearths melting.

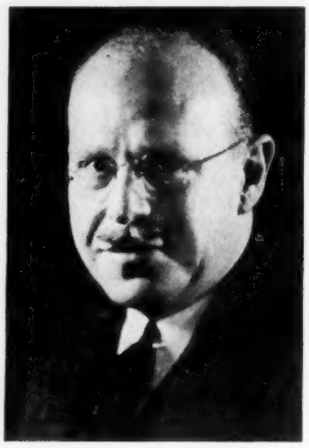
Cleveland—Irregular schedules reduced the rate last week to 28 per cent, a loss of 3 points. Indications are for practically the same schedule for this week.

■ Columbia Steel Co., San Francisco, subsidiary of the United States Steel Corp., increased ingot production March 1 by placing four additional open hearths in operation. Three furnaces were lighted at the Torrance, Calif., plant, where ingot production had been interrupted since December. The fourth relighted furnace is at the Pittsburg, Calif., plant.

MEN OF INDUSTRY

■ JAMES CAVEN FOSTER has resigned as general manager of sales, Jones & Laughlin Steel Corp., Pittsburgh, to become president of Northwestern Barb Wire Co., Sterling, Ill. He succeeds Paul W. Dillon, who has been both chairman of the board and president, and retains the chairmanship.

Mr. Foster has been identified with Jones & Laughlin throughout his industrial career, practically all of which has been spent in sales work. He went to work in 1913 in the order department and two years later was transferred to the sales department, where he remained continuously except for a brief period during the World war. He was made manager of wire sales in 1932 and general manager of sales in 1935.



James C. Foster

♦

E. Etzel, former purchasing agent, Toledo Steel Products Co., Toledo, O., has been transferred to the main plant of Thompson Products Co. Inc., Cleveland, as buyer.

♦

Elie Braxton Pitts retired March 1 as manager of Tennessee Coal, Iron & Railroad Co.'s Ensley mercantile store. He had been an employe of the company 52 years.

♦

John K. Crippen has recently been named assistant advertising manager, Herman A. DeVry Inc., Chicago. He has charge of the sales promotion and industrial service departments.

♦

H. H. Fuller has been appointed manager of sales, and R. H. Massey and A. P. Hall, assistant managers of sales, in the New York district sales office for Bethlehem Steel Co., Bethlehem, Pa. C. W. Bretland, whom Mr. Fuller succeeds, has been assigned to new duties and appointed special sales representative.

Mr. Bretland has been with the company since 1909. Prior to going to New York, he was structural and plate sales agent in the Pittsburgh district, and before that was associated with the company's Chicago office.

Mr. Fuller entered the service of Bethlehem in the New York sales office in 1919, and was named assistant manager of sales in that district in 1936. Mr. Massey joined the company in 1923 following its acquisition of Cambria Steel Co., with which he had been associated since 1916. Mr. Hall has been with the company since 1922 and was attached to the Cleveland sales office prior to his transfer to the New York district where he was resident salesman at Bridgeport, Conn.

R. H. Massey

H. H. Fuller

A. P. Hall

♦

Edgar A. Fisher has been named general budget director, appliance engineering department, Frigidaire division of General Motors Corp., Dayton, O. F. H. McCormick has been made manager of that department.

♦

Charles W. Zink, for the past 15 years assistant superintendent, sheet metal department, Highland Park plant, Chrysler Corp., has been named superintendent. He succeeds the late F. L. Alldis.

♦

W. F. McGarrity and Joseph Luchansky have been appointed chief metallurgist and assistant chief inspector, respectively, tin division, Irvin works, Carnegie-Illinois Steel Corp. Mr. McGarrity formerly was a sheet metallurgist at the company's offices in Pittsburgh, and Mr. Luchansky formerly was assorting room foreman at the tin mills of the Farrell, Pa., works.

♦

Joseph A. Moskowitz, Samuel Sons Iron & Steel Co. Inc., Brooklyn, N. Y., has been appointed chairman of the industrial relations committee, Institute of Scrap Iron and Steel Inc., New York.

♦

Bernard Lester, former assistant manager, industrial sales department, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has been appointed manager of a new division, called the resale department.

♦

B. F. Devine, Chain Belt Co., Milwaukee, was re-elected chairman, Mixer Manufacturers bureau at its annual meeting in Cleveland recently. The bureau is affiliated with the Associated General Contractors of America Inc.

♦

Arthur M. Price, Price-Watson Co., Chicago, has been appointed chairman of the railroad scrap committee, Institute of Scrap Iron and Steel Inc., New York. Tom Allen, Continental Iron & Steel Co., New York, is vice chairman.

♦

Frank Purnell, president, Youngstown Sheet & Tube Co., Youngstown, O., has been named chairman of the new committee recently cre-

ated by the National Association of Manufacturers to improve health and safety standards in factory working conditions. H. C. Beaver, president, Worthington Pump & Machinery Corp., Harrison, N. J., is vice chairman.

♦

Frank J. Carr has been appointed assistant to the president, American Steel & Wire Co., Cleveland. Mr. Carr for the past four years has been comptroller, Tennessee Valley Authority, Knoxville, Tenn., and previous to that was comptroller of Aviation Corp. and subsidiaries. He was graduated from Wharton School of Finance, University of Pennsylvania in 1915.

♦

P. N. Guthrie Jr. resigned March 1 as president, Reading Iron Co., Philadelphia. Mr. Guthrie became associated with the Reading Iron Co. Dec. 1, 1929, as vice president in charge of sales and on Nov. 18, 1930, was elected president.

P. N. Guthrie Jr.

♦

Paul H. Hake, since 1924 foreman of the billet mill at the Gary works of Carnegie-Illinois Steel Corp., has become associated with Youngstown Sheet & Tube Co., Youngstown, O., as superintendent of blooming and rolling mills, Brier Hill plant. Donald Blasier has been made assistant to Mr. Hake. He formerly was employed at the South Side plant of Jones & Laughlin Steel Corp., Pittsburgh.

♦

Clayton S. Coggeshall has been made general assistant to R. B. Beale, manager of the turbine division, central station department, General Electric Co., Schenectady, N. Y. He was formerly manager of sales of the turbine division, Lynn River works. John L. Kerr, previously turbine specialist in the central district, has taken Mr. Coggeshall's place at Lynn, and Robert S. Neblett has become manager of sales, Schenectady section, turbine division.

Howard A. Lincoln

Who, as noted in STEEL, Feb. 28, page 24, has been made vice president and general manager, Bemis & Call Co., Springfield, Mass. He formerly was general manager of the company

♦

Gregory P. Grace, Robertshaw Thermostat Co., Youngwood, Pa., has been elected chairman of the Pittsburgh chapter, American Society of Tool Engineers. James P. Wiley, National Tube Co., McKeesport, Pa., is the new vice chairman; Malcolm F. Judkins, Firth Sterling Steel Co., treasurer, and E. D. Gangwere, Westinghouse Electric & Mfg. Co., secretary.

♦

C. A. Dundore, Underwood Elliott Fisher Co., has been elected chairman, and B. Page, Bullard Co., vice chairman of the Bridgeport, Conn., chapter of the American Society of Tool Engineers. H. De Angelis, Locke Steel Chain Co., and H. Carter, Singer Mfg. Co., have been elected secretary and treasurer, respectively.

♦

Charles L. Wedow has been appointed manager of the Chicago sales office, National Screw & Mfg. Co., Cleveland. Before joining this company last year he was with the Cleveland Cap Screw Co., and prior to that served for some years as sales manager of the Superior Screw & Bolt Co. Another addition to the Chicago office is J. J. English, who has been transferred from the Cleveland sales department.

J. A. Comstock

Whose appointment as consulting metallurgist with the Surface Combustion Corp., Toledo, O., was noted in STEEL Feb. 28, page 24. He formerly held a similar position with the Illinois Tool Works, Chicago

♦

Monro B. Lanier has been elected a director and executive vice president, Ingalls Iron Works Co. and subsidiaries, Birmingham, Ala. He began his business career as a laborer in the coal mines, subsequently serving as mining and combustion engineer. Prior to taking his new post on Jan. 20 this year, he was senior vice president and a director, Freeport Texas Co., Freeport Sulphur Co., Cuban-American Manganese Corp. and president of the Cuban Mining Co., with headquarters in New York.

♦

John Hulst, vice president, United States Steel Corp., recently celebrated his sixty-sixth birthday at his home in the Hotel Pennsylvania, New York. Guests of Mr. Hulst included Col. A. H. Swartz, of Cleveland, an old friend and former business associate in the steel industry; C. F. W. Rys, chief metallurgist, Carnegie-Illinois Steel Corp., Pittsburgh; John Sias, assistant vice president of the Steel corporation, who is being transferred from New York to Pittsburgh; Walter Rachals, assistant to the vice president, United States Steel Corp., New York, and H. J. Davis, formerly general superintendent, Blairton Steel & Coke Works of Carnegie-Illinois.

A motion picture of the launching of the JOHN HULST, a 600-foot ore boat, was shown by his associates.

♦

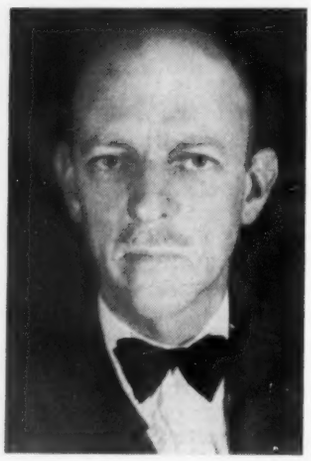
A. S. Gray, Insulation Manufacturers Corp., has been elected president, Machinery Club of Chicago. Other officers are vice president, a representative of Pratt & Whitney Co., name not yet announced; secretary-treasurer, A. W. Smith, L. S. Starrett Co. Directors include V. R. Clark, V. R. Clark Belting Co.; Frank Seese, Marshall & Huschart Machinery Co.; L. S. Nutting, Latrobe Electric Steel Co.; C. F. Sturgeon, Arch D. Corrigan Co.

♦

Kemp G. Fuller has been appointed manager, market research and sales statistics, United States Steel Corp. of Delaware, with offices at 436 Seventh avenue, Pittsburgh. He formerly was employed in a similar capacity with Carnegie-Illinois Steel Corp. After graduation from Dartmouth college in 1921. Mr. Fuller took a post-graduate course in business administration, and has been engaged in market research and sales work since 1922. He is a

Kemp G. Fuller

member, American Marketing association, American Industrial Development council, International Electrotechnical committee and from 1934 to 1936 was a director, American Management association.



Porter B. Chase

Who has assumed the duties of president and treasurer, Bemis & Call Co., Springfield, Mass., wrench manufacturer, in which he, with Howard A. Lincoln, purchased a controlling interest, as reported in STEEL, Feb. 28, page 24. He is also president, Sesamee Lock Co., Hartford, Conn., maker of keyless locks. A consolidation of the manufacturing and marketing facilities of both companies has been effected

DIED:

■ HARRY C. FORD, since October, 1937, superintendent of the production and shipping department, Irvin works, Carnegie-Illinois Steel Corp., in Pittsburgh, Feb. 26. He formerly had been assistant to the general superintendent, New Castle works. Mr. Ford began his connection with the company in 1903 at the Cambridge plant of American Sheet & Tin Plate Co., now part of Carnegie-Illinois.

♦

J. C. Wright, 50, president, Wright Oil Tool Co., Los Angeles, in that city recently.

♦

Paul H. Diver, magnet sales manager, Ohio Electric Mfg. Co., Cleveland, in that city, Feb. 26.

♦

E. D. Tribbet, 73, treasurer, American Laundry Machinery Co., Cincinnati, in that city, Feb. 21.

♦

August J. Ameel, 63, general foreman of the final assembly line of Dodge Bros. Corp., in Detroit, Feb. 19.

♦

John H. Daller, 62, until 1936 secretary-treasurer, E. T. Barnum Wire & Iron Works, Detroit, in that city, Feb. 23.

♦

Henry A. Wagner, 71, until 1932 sales manager of bolt and nut products, Bethlehem Steel Co., Bethlehem, Pa., in that city, Feb. 2.

♦

H. Ansel Moskowitz, 21, youngest of five brothers forming Moskowitz Bros., scrap dealers, Cincinnati, Feb. 27 at Cincinnati.

♦

H. S. Campbell, 53, controller, Crane Co., Chicago, in that city, Feb. 18. He had been associated with the company since 1909 serving as controller the past five years.

♦

Walter J. Berbecker, 48, president of William Schollhorn Co., New Haven, Conn., manufacturer of steel tools, and of Julius Berbecker & Son Inc., New York, in New York, Feb. 27.

♦

Charles F. Bailey, in charge of development work in the engineering department of Keystone Steel & Wire Co., Peoria, Ill., in that city recently. He had been with the company over 35 years.

♦

Robert Wilson Lynch, 68, in Daytona Beach, Fla., Feb. 25. For 40 years prior to his retirement in March, 1937, Mr. Lynch was in the sales and order department of Carnegie Steel Co. and its successor, Carnegie-Illinois Steel Corp.

♦

Gustav A. Merkt, manager combustion control department, Morgan Construction Co., Worcester, Mass., in Worcester, Feb. 20. Prior to joining the Morgan company in 1925, he held engineering positions with American Steel & Wire Co. and Wickwire Spencer Steel Corp.

♦

Jacob S. Disston, 76, a director of Henry Disston & Sons Inc., Tacony, Philadelphia, in Belleview, Fla., Feb. 28. A son of Henry Disston who founded the company in 1840, Mr. Disston joined the firm after attending the University of Pennsylvania. He served as treasurer and vice president.

MEETINGS

STEEL INSTITUTE'S MEETING IS SET FOR MAY 26

■ American Iron and Steel institute's forty-seventh general meeting will be held at the Waldorf-Astoria, New York, Thursday, May 26. Program has not been announced. Attendance at the meeting and banquet, it is stated, will be restricted to individual members of the institute.

SHEET METAL GROUP WILL RESUME SPRING MEETINGS

National Association of Sheet Metal Distributors, an affiliate of National Wholesale Hardware association, will hold its annual spring meeting at Hotel Cleveland, Cleveland, May 16-17. Resumption of this spring meeting is prompted by success of a similar meeting in Cleveland a year ago, and action of mills in restoring the functional allowance on galvanized flat sheets, formed roofing and siding, following the association's semiannual meeting in Chicago last October. George A. Fernley, 505 Arch street, Philadelphia, is secretary.

Machinery Exports Up 36 Per Cent in January

■ Industrial machinery exported from the United States in January totaled $22,456,168, a gain of 36 per cent over January, 1937, when it was valued at $16,530,765, according to the machinery division of the department of commerce.

Power-driven metalworking machinery exports were valued at $5,968,604, 38 per cent more than the $4,314,629 in January a year ago. Practically all types of this equipment contributed to the gain but largest growth was in rolling mill machinery, $1,061,003, compared with $251,836; knee and column type milling machines, $447,522 against $221,431; engine lathes $601,088 compared with $256,935; other lathes $276,880 against $139,076.

Other metalworking machinery exports in January were valued at $297,761, exceeding by 10 per cent the $270,877 value for January, 1937. Textile, shoe and sewing machinery gained 18 per cent over a year ago.

Power generating machinery exports were 194 per cent greater than January, 1937, at $3,529,422, compared with $1,200,987. Most of this gain was in locomotives, $2,147,500, compared with $176,591. Construction and conveying machinery was exported at 61 per cent higher value than a year ago and mining, well and pumping machinery gained 1 per cent.

New Design Used In 3 Buildings

■ A NEW copyrighted design of steel construction is being used for the first time in building three apartment houses in New York. The first project to get under way is the 17-story Southmoor House, 230 Central Park South, requiring 600 tons, fabricated by the Belmont Iron Works, Eddystone, Pa.

The second is an 18-story apartment, Madison avenue and Eightieth street, 800 tons, fabricated by the Harris Structural Steel Co., New York. The third, a 13-story apartment, Monroe place, Brooklyn, requires 500 tons, fabricated by Bethlehem Fabricators, Bethlehem, Pa.

The new type is known as the T & L design. Instead of the usual type of column with H shaped cross-section, the T and L columns completely embedded in the exterior walls and interior partitions are used.

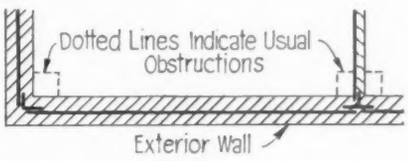
According to specifications filed in the United States patent office, by M. X. C. Weinberger, structural engineer, New York, the designer:

"The object of the invention is the elimination of the H-column now commonly used in building construction. This is with particular reference to such buildings as are subdivided by a multiplicity of permanent partitions, such, for example, as apartments, hotels and hospitals. By the use of T shapes and L shaped columns there is attained a layout in which the corners of the rooms are clean and sharp without the unsightly breaks which occur in the former type of design.

"A further object is to use a T shaped column obtained by longitudinally splitting or cutting the web of an H-column through the center, thereby obtaining two symmetrical T's from one H; the T's thereby having parallel surfaces in both web and flange.

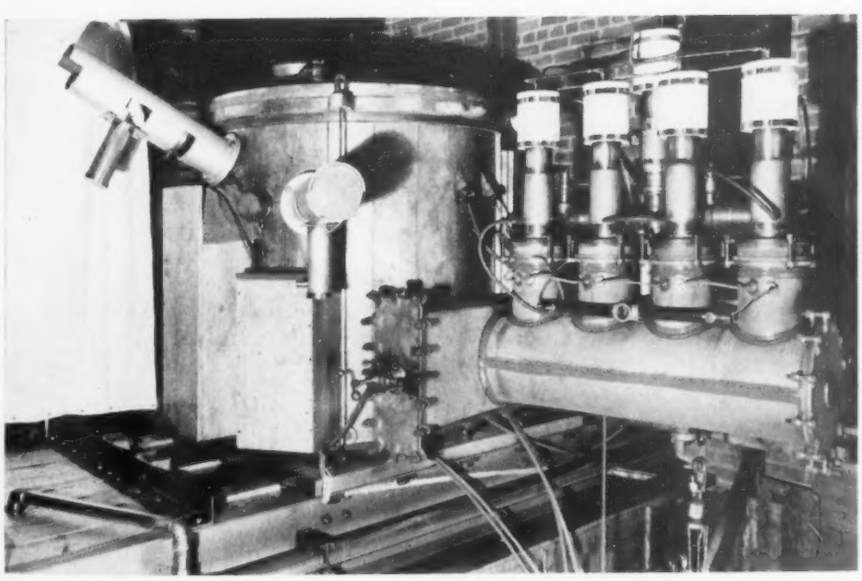
"This permits framing to be directly attached to web or flange, thereby eliminating or reducing to an absolute minimum eccentricities in such columns. It will also be readily seen that the manner of framing lends itself exceptionally well to field welding.

"A still further object is a design whereby the (T and L) columns may be buried completely in the masonry enclosing structure or the intermediate fireproof partitions, forming the subdivisions of the structure so that practically no additional fireproofing of such columns is necessary."



How T and L steel columns are used

Stainless Steel in Million-Volt X-Ray Machine



■ **Ever-widening are the miscellaneous uses for stainless steel, although the automotive, chemical and textile, food and beverage, and railroad industries continue as major consumers. One large producer estimates 35 per cent of its 1937 sales were for miscellaneous uses, ranging from pen points to the million-volt X-ray machine, above. Photo courtesy Electro Metallurgical Co., New York**

Export Scrap Has Wide Price Range

■ PRICES paid for steelmaking scrap by nations exporting from the United States vary considerably, as shown by statistics of the metals and minerals division of the department of commerce. In January exports, the low price was $10 on 1955 tons from a Rhode Island port to Belgium. The highest was $30.77 on 26 tons to the Netherlands.

While statistics do not reveal individual transactions, they indicate definite trends. For instance, England paid an average of $17.47 a ton for 128,100 tons it took in January, practically unchanged from the December figure, 126,641 tons. Poland accounted for 59,476 tons in January for which it paid an average price of $18.09, almost identical with that for 53,150 tons in December. Significantly, it is noted that Italy, which buys its material independently of the European scrap cartel, paid an average of only $15.71, compared with approximately $18 in December. Recently, buyers for that country have been offering no more than $15 for No. 1 heavy melting steel. The January total of 47,617 tons compared with 42,445 tons for the preceding month.

January Prices Lower

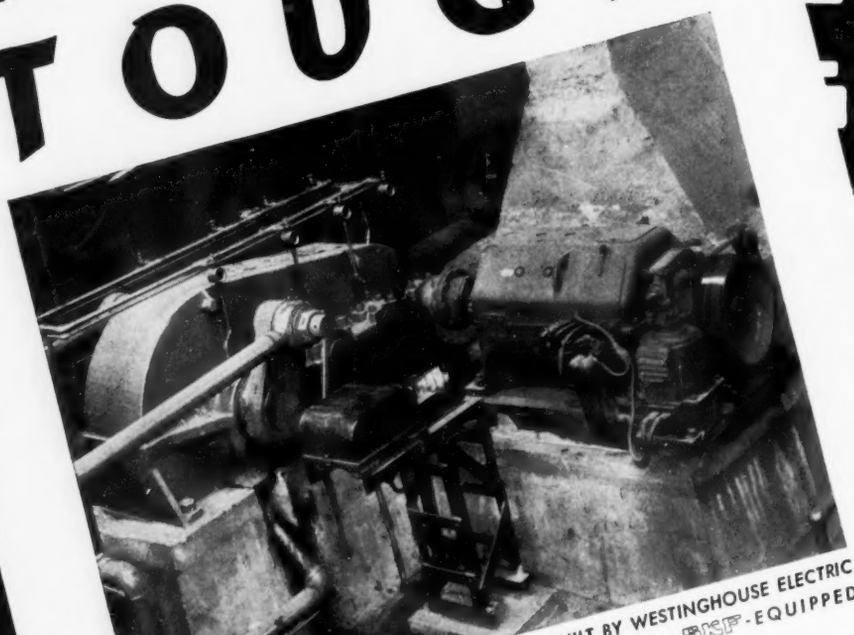
Japan, which of course also buys its scrap outside the cartel, paid an average of $18.04 for 31,281 tons in January, compared with about $20 a ton for 9336 tons in December. The Netherlands paid an average of $16.66 for 58,232 tons in January compared with about $18 a ton for 32,995 tons in December.

Belgium took in 10,115 tons in January at an average price of $14.45. This average is distorted, however, by the fact that some material was booked at $10 a ton. Presumably this material was No. 2 compressed sheets, which currently are available at this level.

Average prices for the entire tonnage imported by any one country are only roughly indicative of the price trend since a small tonnage at a high price would throw the average figure sharply out of line. Shipments from various customs districts are closely reflective of market conditions, as for instance an item of 10,289 tons which moved from Philadelphia to Great Britain at $15.77. It is known that the large tonnage booked by the scrap cartel several weeks ago was on the basis of $16 or less for No. 1 steel, rather than the $16.50 price originally reported. Incidentally, it is reported in the trade that much of the scrap currently moving to Poland and the Netherlands is subsequently finding its way to Germany.

WHEN SKF-EQUIPPED MOTORS GO ON A JOB
THEY STAY ON THE JOB BECAUSE THE BEARINGS ARE

TOUGH



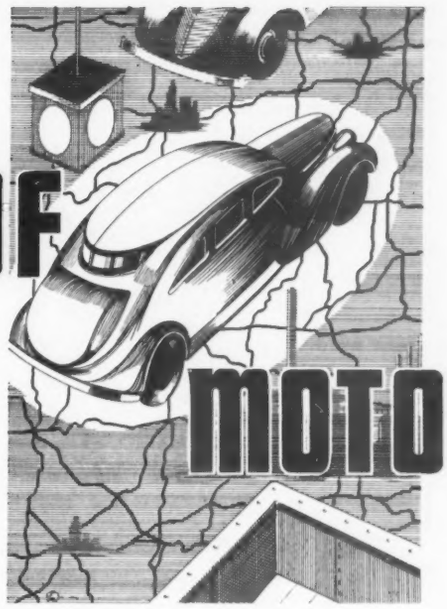
BUILT BY WESTINGHOUSE ELECTRIC & MFG. CO. SKF-EQUIPPED

Bearings are the part which permit or prevent a motor from wearing out. They are the connecting link between the motor and production schedules and costs. On these MC mill type motors driving pusher and lift tables on ingot presses they assure dependability, long motor life, and a maintained air gap. The reason is obvious. They are SKF.

SKF INDUSTRIES, INC.
Front St. & Erie Ave. Phila., Pa.
4011

SKF makes more types and sizes of ball and roller bearings than any other manufacturer in the world.

MIRRORS OF MOTORDOM



DETROIT

■ OFFICIAL pronouncements in behalf of national used car exchange week rained out from publicity headquarters of the industry's co-operative campaign last week as executives of automobile companies, steel companies, dealer organizations and the like added the weight of their recommendations to the $1,250,000 advertising campaign now sweeping across the country. The drive, in which all automobile manufacturers and their 46,000 dealers are co-operating, is said to represent the largest advertising program ever conceived anywhere, concentrated as it is in an 8-day period.

Obviously, however successful it will be, it is not going to mean much of a reduction in used car stocks now in the hands of dealers and on used car lots—variously estimated at from 600,000 to 800,000. For nearly every sale of a used car, a dealer probably will have to take in an older car, the net result being an improvement in the dealer's cash position and a reduction in his inventory; but he will still be faced with the problem of what to do with new acquisitions of decrepit cars.

Ford Guided Campaign

Delving behind the scenes in this high-pressure merchandising drive, some can see the canny hand of Ford seeking to habilitate his dealers so they will be in position to sell the new small Ford now reputed to be in process of development. Naturally the first reaction of a dealer to a new and less expensive line of cars is a protest against the adverse effect such a line has on stocks of used cars. If a concerted selling drive can wipe out most of the heavy investments in used cars, then the introduction of a new line might be welcomed by dealers.

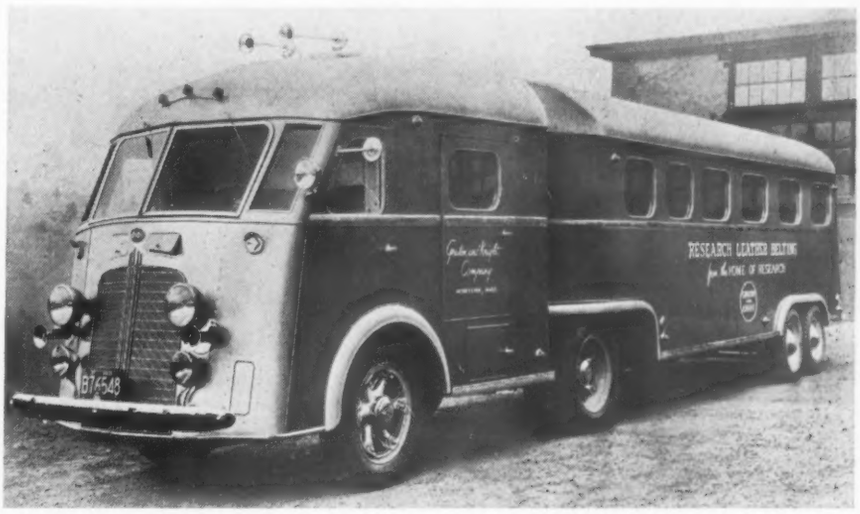
The present used car drive idea originated with Ford, and later was sold to the Automobile Manufacturers association, of which Ford is not a member. The story is that certain members of the AMA were not too enthusiastic over the idea when it was proposed, but finally decided it would be the better policy to co-operate.

There are other angles. Why should Ford, for example, suddenly take the lead in a costly program to sell used cars, if he did not have some important follow-up plans? An advertising agency handling Ford business is directing all publicity on the campaign and is handling all newspaper advertising on the program, the latter comprising the major share of the advertising appropriation.

Ford sales this year have swung heavily in the direction of the deluxe model, which has been outselling the standard model by a wide margin and reversing the experience of last year. This runs contrary to the Ford philosophy of mass transportation at low cost and the company might logically be expected

BY A. H. ALLEN
Detroit Editor, STEEL

Traveling Laboratory



■ **Graton & Knight Inc., Worcester, Mass., has placed on the road an 18,000 dollar, traveling laboratory which is traveling around the country stopping at various previously scheduled plants, and testing the company's belts under controlled conditions similar to production in shop operations. Laboratory consists of a 10-ton tractor unit hauling a streamlined trailer which houses testing equipment. A gas engine in the tractor unit furnishes 220-volt, 3 phase alternating-current up to 5 kilowatt capacity, making the laboratory entirely independent of any outside source of power**

to take steps to re-establish itself in the low-price field. But this cannot be done at the expense of dealers loaded up with used cars.

Ford production apparently has caught up with demand, for last week assemblies were cut back sharply, lines at the Rouge plant being practically at a standstill. Other departments likewise were affected, two more open hearths being taken off at the steel plant, all rolling mills being idle after Friday when the 14-inch mill was stopped, and some manufacturing divisions tapering off sharply.

■ JANUARY production of cars and trucks in the United States and Canada, according to official department of commerce figures, totaled 228,074, slightly under preliminary estimates. This represents a 43 per cent decline from last year. Preliminary estimates for February totals indicate approximately 220,000, compared with 383,698 in February last year.

Plymouth again this year has announced its "highboys"—a special line of high-wheel models designed for smoother travel over deep-rutted roads in rural sections. Twenty-inch disk wheels give axle clearance of 9⅞ inches, or 1½ inches greater than standard.

Publication of the local board of commerce recently presented an interesting comparison of business vs. government costs. Comparing a 1910 model limousine with an 8-cylinder sedan of 1937 vintage, a reduction in cost of 80.6 per cent—from $5550 to $1075—was noted. Contrasted were increases in government costs in the same 27-year period: Yearly cost of federal government, up 1068 per cent; public debt of federal government up 3075 per cent; per capita federal debt up 2120 per cent. Question: Which needs reforming—business or government?

In connection with changes proposed by automobile financing companies in a letter to the President, it was revealed that 54 per cent of the paper now held by the "big four" financing companies has less than 6 months to run, 85 per cent less than 12 months.

■ STEEL buying is showing improvement and prospects for this month are for continuation of an increase in bookings. February buying was well ahead of January, although still far below normal levels. One encouraging factor has been a steady rise in the number of orders received, despite the fact most of them are for minor tonnages. Both General Motors and Chrysler divisions have been buying in limited amounts. A Ford spokesman, on the other hand, ventures the opinion Ford will be out of the steel market until the end of April at the earliest.

Inquiries on steel needs for 1939 models already are being figured by local steel company sales offices, marking the earliest appearance of new model business in many years.

Progress on design and specifications for 1939 models is being made at a record pace. Dies for new Buick, Olds and Pontiac models will be made at the Fisher Body plant here; those for the Chevrolet line will emanate from Fisher at Cleveland. Trend in all four will be toward the lines of this year's Cadillac 60. Roofs will be flatter and windshields and rear windows will be a single piece of flat glass, instead of the present divided type. Catwalks between fenders and hood will be raised several inches. Radiator grilles will be smaller and located in the lower half of the front end.

A tentative design worked out for Olds calls for a series of horizontal louvres extending across the front of the hood, back on the sides for a short distance to meet a continuation of the lines across the front of the catwalks. The hood itself probably will be a solid sheet of steel without louvres and lifting up from the front. The design is faintly suggestive of the front end of the Cord. The new styles, which will be carried throughout the GM line with modifications, seem to imply a larger amount of sheet steel and more complicated drawing operations. They stand high in eye-appeal.

Nash has awarded body dies for 1939 models, dividing the business between one of the larger local die shops and a Grand Rapids body fabricator.

Chevrolet gear and axle plant here has inquiries out for a number of types of equipment, some of which is for replacement of obsolete machinery.

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1936	†1937	1938
Jan.	377,244	399,186	228,074
Feb.	300,810	383,900	*220,000
March	438,943	519,022	.....
April	527,625	553,231	.....
May	480,518	540,377	.....
June	469,368	521,153	.....
July	451,206	456,909	.....
Aug.	275,934	405,072	.....
Sept.	139,820	175,630	.....
Oct.	230,049	337,979	.....
Nov.	405,799	376,629	.....
Dec.	518,958	346,886	.....
Year	4,616,274	5,015,974	.....

*Preliminary.

†1937 figures revised.

Week ended

Feb. 5	51,443
Feb. 12	57,810
Feb. 19	59,100
Feb. 26	56,977
March 5	54,440

	Week ended March 5	Feb. 26
General Motors	23,750	21,950
Chrysler	11,150	10,450
Ford	11,500	15,570
All others	8,040	9,007

■ OUTLOOK among General Motors and Chrysler divisions is somewhat brighter. Buick and Cadillac have gone to four-day production schedules, and Pontiac likely will move up to three days this week after several weeks of two-day assemblies. Chevrolet is holding at three days and at the moment holds no prospect for a change.

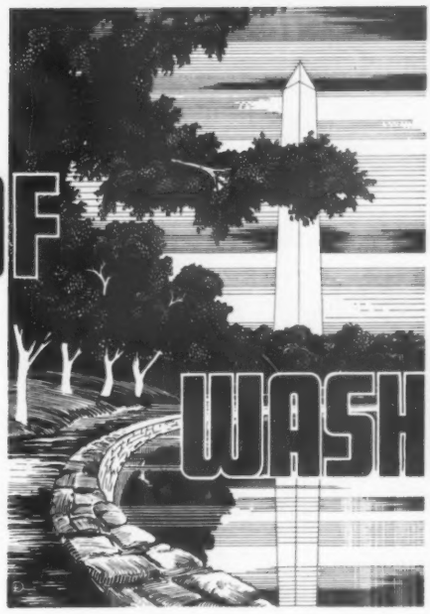
One and two hours are being added to working days at Dodge, Plymouth and DeSoto divisions of Chrysler, although weekly schedules are still at three days.

Reports here last week of 20,000 men being returned to work at auto plants are seriously questioned. The statement was made by a welfare official appearing before the city council, and he did not say where he obtained his figures. It is doubtful if anywhere near this number returned to jobs, since before any additional men are given employment, the daily schedules of those now working will be lengthened.

On the basis of manufacturing efficiency primarily, and out of consideration for the men as well, a number of manufacturers are coming to the conclusion that the spread-the-work plan is coming to be untenable. Working three days of 5 hours each, the average employe is hard put to eke out a living, and plant managers are finding it impossible to make any kind of efficiency showing.

As a result, last week Briggs officials were debating the advisability of releasing about half the working force and placing the remaining men back on an 8-hour day for the three days the plants operate. At present two shifts are being worked 4 to 5 hours a day, three days a week. Under the new arrangement, one shift would work 8 hours for the same weekly period. A further disadvantage of the present arrangement is that workers are not eligible for relief or WPA work as long as they have any income, no matter how small. And average incomes have been somewhere in the neighborhood of $13 weekly, almost below the family subsistence level.

WINDOWS OF WASHINGTON



BY L. M. LAMM

Washington Editor, STEEL

WASHINGTON

■ THE WAYS and means committee of the house worked for four months on the new revenue bill which it finally reported last week. Representative Doughton, North Carolina, chairman of the committee, made the remark to newsmen "that any cause for hesitation on the part of business to go forward, as far as taxes are concerned, should now disappear."

The chairman contended that business has the assurance inequities and unjust burdens have been removed along with grounds for complaint against the undistributed profits tax. He said uncertainty was one element which frightened business and he contended that the new revenue bill should remove that.

There was much talk in the committee of an outright repeal of the undistributed profits tax, which has drawn so much criticism from business, but those wishing this repeal were not strong enough to make the grade.

On the other hand, it is said a very strong sentiment has developed in the senate finance committee for the outright repeal of this tax and for further downward rates in the administration's tax revision bill, as reported to the house last week.

Members of the house committee are enthusiastic about the bill and they feel that even if it has taken them a long time they have done a good job. The bill provides for modification of the undistributed profits and capital gains taxes and imposition of a new surtax on large income corporations controlled by a few individuals or a family. This latter matter caused considerable disagreement in the committee.

BILL ON LICENSING OF PATENTS CAUSES FUROR

Considerable controversy has developed over the compulsory licensing of patents bill introduced recently by Representative McFarlane, Texas, (H. R. 9259). Inventors, engineers and research men working in the machine design and other metal working fields, as well as patent attorneys, have been much aroused by this bill, the subject of which has been controversial during the past 20 or 25 years.

The bill was referred to the house committee on patents and that committee has referred it to a subcommittee for consideration, including Representative O'Malley, Wisconsin, as chairman. Other members of the subcommittee include Representatives Hartley, New Jersey; Sachs, Pennsylvania; Stefan, Nebraska; Sirovich, New York; Johnson, Minnesota; Dunn, Pennsylvania, and Connery, Massachusetts.

Expect Delay in Passage

Considerable pressure has been brought to bear for a hearing and it is considered likely the subcommittee may hold hearings although no date has yet been set. It is practically a foregone conclusion, however, that no definite action will be taken at the present session of congress, but enough can be done to lay a ground work for enactment at another session.

Officials of the patent office refuse to discuss their attitude as it is pending legislation and as they may be called upon to express an official opinion when hearings are held.

Patent lawyers in Washington are much concerned about the bill and have unofficially gone on record as opposed to it. Information reaching Washington from various parts of the country also indicates that engineers are raising objections.

Under the provisions of the bill it would be compulsory for a patentee to grant a license to a so-called "legitimate" applicant to manufacture and sell under a patent after a period of only 3 years. (See also page 43, this issue).

O'MAHONEY COMMENTS ON LICENSING BILL

Senator O'Mahoney, Wyoming, co-author of the federal licensing bill with Senator Borah, Idaho, made some interesting statements last week regarding industry and the purposes of his bill.

"The corporation is an indispensable agency of commercial and industrial progress and as such should be fostered and encouraged," said the senator.

"Its powers for good are matched only by its powers for evil. It is the means by which the combined capital and genius of many may be directed to the accomplishment of great national purposes. It may be made the promoter of efficiency and economy in production and distribution of all the commodities which the human family needs or desires. It may be made the instrumentality by which the benefits of the inexhaustible resources of the earth may be shared by all mankind. But we shall be blind, indeed, to the facts if we fail to perceive, also, that in the hands of selfish, ambitious and ruthless men the corporation can be and has been made the instrumentality of oppression and injustice.

Sponsor Praises Provisions

"The proposal embodied in the bill offered by Senator Borah and myself for the licensing of corporations engaged in interstate and foreign commerce is based upon this premise, that if the federal government is to discharge the function committed to it by the constitution, of regulating interstate commerce in such manner as to promote the general welfare of all the people of the union, it must, first of all, undertake to prescribe the structure, powers and responsibilities of the corporate agencies by which that

commerce is carried on. It is idle to expect the introduction of any permanent stability into our commercial system so long as the states which have no power or capacity to deal with national commerce are permitted, without the supervison of the national government, to create the artificial agencies through which and by which this national commerce is conducted."

Senator O'Mahoney called attention to the fact that the conditions of licenses are fixed in the bill and no authority is given to the federal trade commission, the administrative agency, to modify them in any part. The requirements thus stated in the measure itself are:

"First, every corporation shall adhere to certain minimum labor standards, collective bargaining, no child labor, no discrimination against women; second, that no licensee shall violate the anti-trust laws; and third, that every licensee shall adhere to certain standards of fiscal integrity and corporate structure, the social and economic value of which no one would question."

LICENSE BILL THREAT TO EARLY RECOVERY

Elmer T. Cunningham, New York, acting chairman of the committee of government relations to industry of the National Association of Manufactures, appeared last week in opposition to the O'Mahoney bill when he stated that any attempt further to regulate American business through passage of a federal licensing bill will reduce present employment and retard recovery for an appreciable time.

Appearing as one of the first witnesses before the committee, Mr. Cunningham attacked the bill as not only dangerous to economic recovery, but entirely void of any foundation or excuse.

"All efforts at this time must be directed towards permanent recovery and increasing employment," he told the committee. "That is the vital task all of us face. To place hundreds of thousands of businesses under licensing investigation at this time will retard, not aid, recovery. Regardless of merit or demerit, this is not the time to make this bill the law of the land."

He estimated that more than 300,000 business enterprises would be required to obtain federal licenses if the bill becomes a law.

SCRAP EXPORT HEARING DATE IS POSTPONED

Senator Thomas, Utah, chairman of the subcommittee of the senate committee on military affairs, who is in charge of hearings in connection with scrap steel exports, announced last week that the hearings have been postponed from March 8 to April 5.

The postponement was asked by former Governor Louis Brann, who is handling the case for the independent steel companies and Benjamin Schwartz of the Institute of Scrap Iron and Steel Inc. They told the senate they are preparing written briefs on the theory that they can save time. They explained to Senator Thomas that with the briefs they will offer only one witness.

Hearings will proceed March 8, however, in connection with the manganese bill of Senator Miller and other bills dealing with metals.

BLAMES GOVERNMENT FOR UNEMPLOYMENT SITUATION

Ralph E. Flanders, Jones & Lamson Machine Co., Springfield, Vt., a member of the Roper advisory council, told the senate unemployment and relief committee last week that policies of the federal government are the sole cause of the business recession.

"This series of blunders must cease if the American worker is to have work and wages and high consumption," said Mr. Flanders. "The unwillingness to spend and the fear to invest is a very widespread phenomenon held by hundreds of thousands of individuals rather than being a result of the fears or malevolence of a small financial group."

George H. Houston, president, Baldwin Locomotive Works, Philadelphia, chairman of the industrial financing committee of the National Association of Manufacturers, also expressed himself similarly. He asserted that government policies are paralyzing private enterprise and causing existing unemployment.

SEEK BETTER WORKING CONDITIONS IN INDUSTRY

Announcement was made last week by Charles R. Hook, president of the National Association of Manufacturers, of the formation of a committee on healthful working conditions. He stated that the creation of this new committee was to promote further adoption of highest possible working condition standards.

Frank Purnell, president, Youngstown Sheet & Tube Co., is chairman of the new committee with H. C. Beaver, Worthington Pump & Machinery Corp., vice chairman. Among other members of the committee are Carl C. Gibbs, National Malleable & Steel Castings Co., and W. L. Settlemire, Mt. Vernon Car & Mfg. Co.

Mr. Hook said: "The initial subjects to be studied will include plant medical services, sanitation, lighting, heating, ventilation and safety. Our survey will be approached through a review of 'minimum standards' in each of these fields as set up by such agencies as the American College of Surgeons, the federal bureau of standards, the National Safety Council and similar organizations. Industrial experience and procedure in applying these standards will then be studied, with a view to their improvement and expansion."

SUPERHIGHWAY PLAN TO BOOST HEAVYY INDUSTRY

The steel industry should be vitally interested in the proposal of Senator Bulkley, Ohio, for superhighways. It is estimated here that if the senator's idea should be carried out some 14,000,000 tons of steel would be used, of which some 7,000,000 would be used for the highways, with the remainder for bridges and other structures.

The President has expressed considerable interest in this superhighway project and has some government experts looking into the matter carefully. Up to this time, he has not received their report.

Some of the proponents of this proposed self-liquidating project contend if it should be enacted into law that at least 30 per cent would be taken off the relief rolls.

Proponents also insist that construction of this system of superhighways will give a tremendous impetus to the business of all heavy industries. Among others that have been mentioned are steel and cement mills, asphalt mines, rock quarries, manufacturers of trucks, tractors, and similar equipment, which it is contended, will receive direct business which will cause them to run to capacity. It is insisted, also, that all other sort of business will be indirectly benefited. The money will turn over many more times than expenditure for PWA labor, proponents contend.

At from $3,000,000 to $4,000,000 per mile on a mileage of approximately 25,000, the total cost would be 6 to 8 billion dollars.

The undertaking, it is insisted by its backers, will result in large scale business to the heavy industries and in increased employment, thereby insuring a permanent recovery.

"COSTS, PRICES AND PROFITS"

The steel industry may be interested in a resolution introduced by Senator Bailey, North Carolina, which the senate committee on commerce reported favorably last week, but which has been referred to the audit committee, owing to the fact that a $25,000 appropriation has been asked.

The resolution, (S. Res. 237) provides that either the commerce committee of the senate or a subcommittee of it be authorized to make a "full investigation of costs, prices, and profits of the principal commodities of our commerce, and to report its findings and recommendations to the senate." Provision is also made in the resolution for holding hearings by the committee during recesses of congress.

EDITORIAL

Revision of Patent Laws Needs Study To Avoid Stifling Industrial Initiative

■ NOW in the germinal stage, as a part of the New Deal's anti-monopoly program, is a drive on existing patent law. The patent situation, according to a recent statement by Robert Jackson, the new solicitor general, lies completely across the anti-monopoly path. Of great importance, therefore, is the recently filed McFarlane compulsory licensing bill known as H. R. 9259.

This bill gives an inventor the exclusive right for 17 years to a royalty through licensing his invention, or to the vending of his invention. But the exclusive right to the manufacture and use of the invention might be restricted to the first three years of the life of the patent.

At any time after the expiration of three years from the date of issuance of the patent any person may file, with the commissioner of patents, an application for a license under this patent. The applicant would present evidence that he is financially responsible and capable of manufacturing the patented article to supply the public and that the public interest will be advanced by issuing to him a compulsory license under the patent. He would state the terms, conditions and royalties under which he proposed to use the license.

Proposed License Law Provides Hearing and Appeal for Inventor

In the event that the applicant is found responsible, and that the public interest would be advanced by granting a compulsory license, the commissioner of patents is to arrange for a public hearing, allowing any interested person or persons to intervene in order to show cause why a compulsory license should not be granted. The commissioner then, in his discretion, would issue a compulsory license for a term of years not to exceed the life of the patent.

Should the patentee consider the commissioner's decision unfair, he would have the right to appeal to a board of appeals to be set up in the patent office. This would consist of three persons, an attorney, an engineer and an economist, to be appointed by the President with the consent of the senate. Should the patentee be dissatisfied with the decision of the board of appeals he would have the right of appeal to the United States court in his district.

In certain respects this bill appears to be conceived in the public interest. It would discourage hoarding of patents and the acquisition or control of patents for the purpose of preventing their exploitation.

Industry Should Guard Against Danger of Retarding Progress

On the other hand, enactment in its present form might serve further to stifle initiative and incentive. As is well known, the original invention must be followed in many cases by a long and expensive development period before the product can be manufactured commercially and a market created for it. Compulsory licenses to other manufacturers after expiration of the initial 3-year period might cause patent-holders to proceed slowly in many cases before assuming the expense and effort involved.

With a campaign under way to revise the existing patent law, it becomes necessary for engineers and industry in general to study the subject. Whatever legislation is enacted should protect not only the public interest but that of industry.

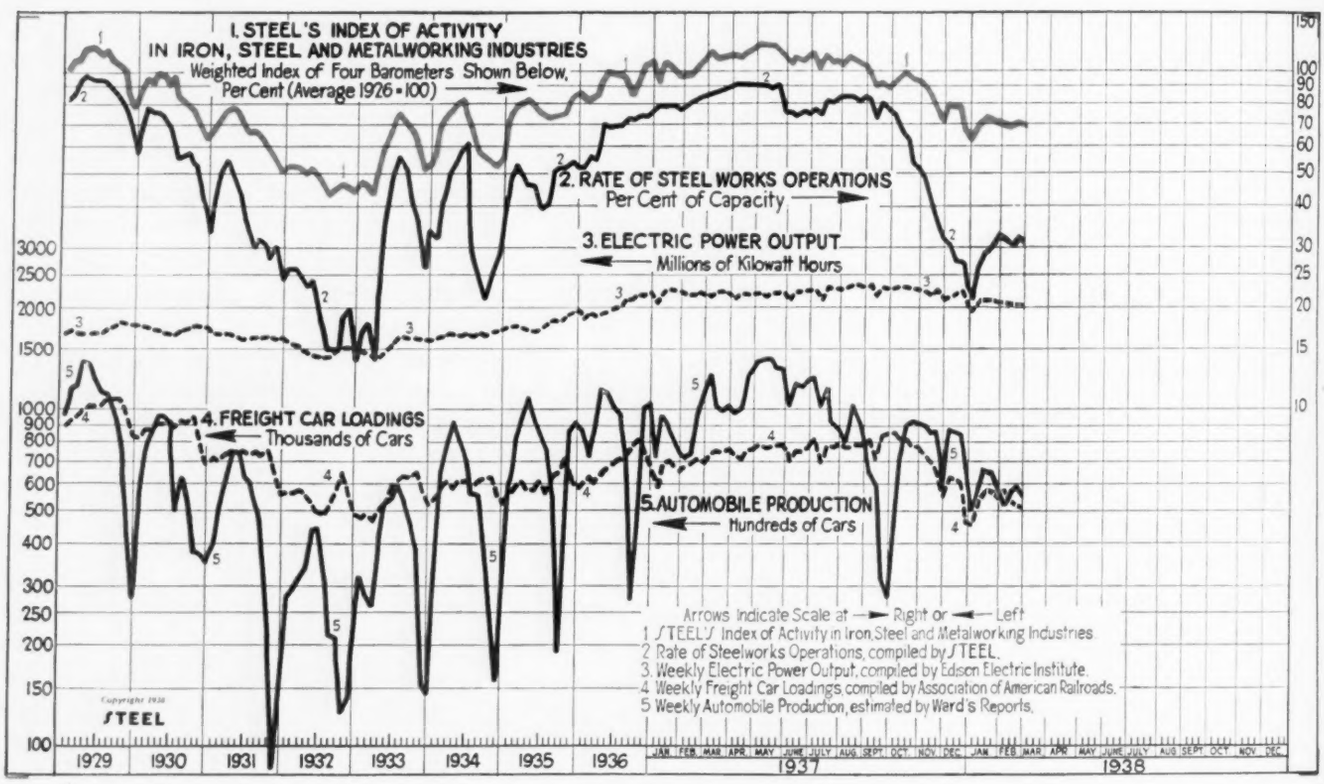
Index of Industrial Activity Awaits Seasonal Impulse

■ INDUSTRIAL activity, which moved within a narrow range of fluctuations throughout February and the latter part of January, now is entering the period of the year when favorable seasonal factors normally become effective.

The first few days of March have witnessed a few developments which may clear the way for slight improvement. One of the most significant of these is the concerted effort of automobile manufacturers—including Ford Motor—to wage a short-term, intensive campaign to stimulate the trading of used cars. If this effort, which is scheduled for the week of March 5-12, proves to be moderately successful, it should help sales of new cars and in turn release some new orders for materials and parts.

A slight impetus from this experiment, coupled with certain seasonal influences, may conceivably move industrial activity off of dead center before the end of the third month.

Meanwhile all four barometers contributing to STEEL's index continue sluggish. Minor losses were reported for the week ending Feb. 26 in revenue freight car loadings, electric power output, automobile production and steelworks operations. Consequently STEEL's index of activity eased to 70.3, a moderate decline from 71.9 in the preceding week.


1. STEEL'S INDEX OF ACTIVITY IN IRON, STEEL AND METALWORKING INDUSTRIES
Weighted Index of Four Barometers Shown Below, Per Cent (Average 1926 • 100)
2. RATE OF STEEL WORKS OPERATIONS
Per Cent of Capacity
3. ELECTRIC POWER OUTPUT
Millions of Kilowatt Hours
4. FREIGHT CAR LOADINGS
Thousands of Cars
5. AUTOMOBILE PRODUCTION
Hundreds of Cars
Arrows Indicate Scale at — ► Right or ◄ — Left
1 STEEL'S Index of Activity in Iron, Steel and Metalworking Industries.
2 Rate of Steelworks Operations, compiled by STEEL.
3 Weekly Electric Power Output, compiled by Edison Electric Institute.
4 Weekly Freight Car Loadings, compiled by Association of American Railroads.
5 Weekly Automobile Production, estimated by Ward's Reports.
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1929 1930 1931 1932 1933 1934 1935 1936 1937 1938

STEEL'S index of activity declined 1.6 points to 70.3 in the week ending Feb. 26:

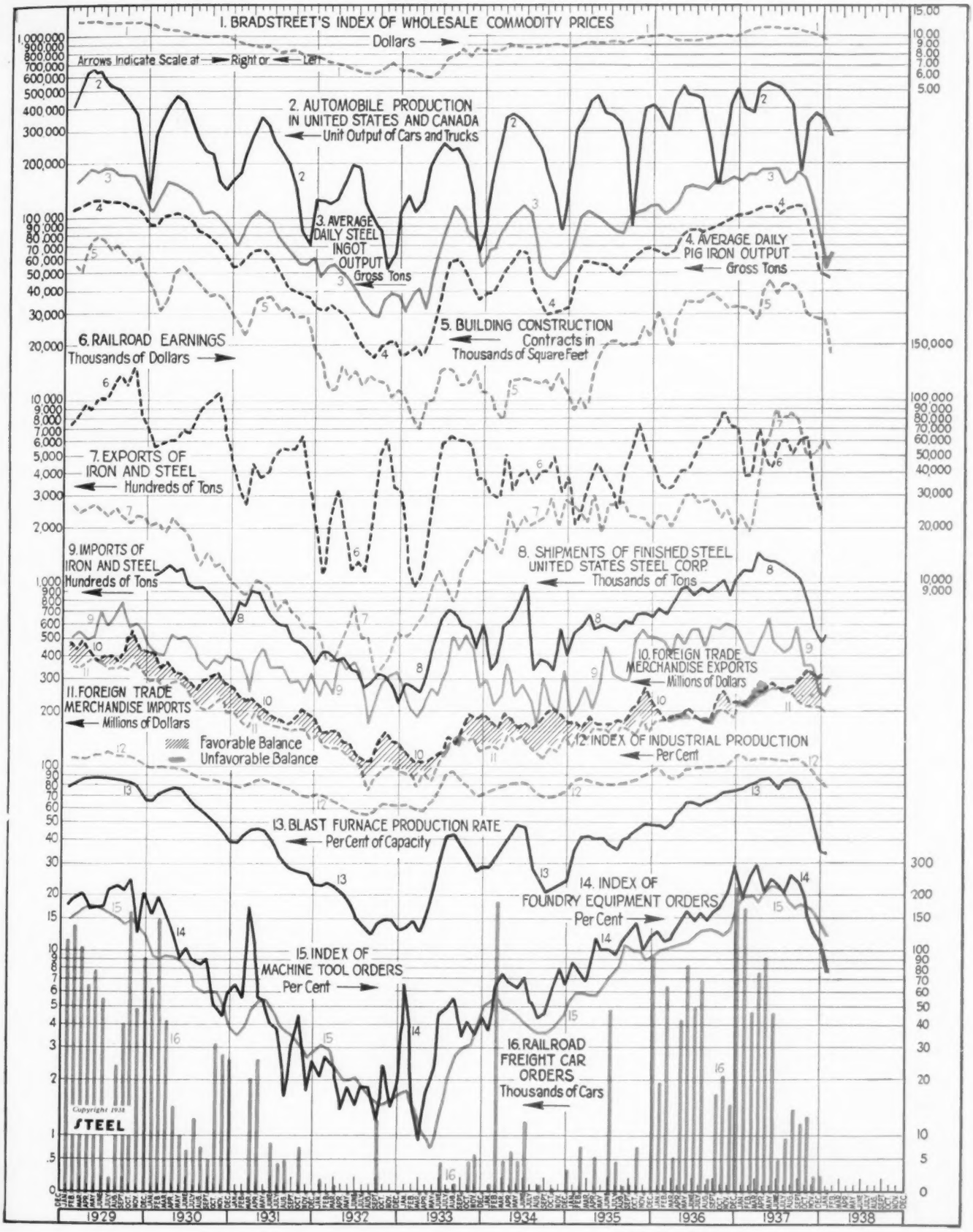
Week ending	STEEL's Index of Activity Index No. 1937	1936	Steelworks Operating Rate Per Cent 1937	1936	Electric Power Output Million KWH 1937	1936	Freight Car Loadings 1937	1936	Weekly Auto Output 1937	1936
Nov. 27	72.7	105.2	31.5	75.5	2,065	2,133	558,627	679,984	58,955	104,283
Dec. 4	81.5	108.4	30.5	76.5	2,152	2,243	623,337	744,957	86,173	100,395
Dec. 11	80.5	113.9	27.0	77.5	2,196	2,278	622,131	738,747	85,765	119,455
Dec. 18	79.4	114.8	27.0	79.5	2,202	2,274	603,292	729,696	82,025	121,038
Dec. 25	69.5	93.3	23.0	68.0	2,085	2,080	460,367	562,218	67,230	79,019
	1938	1937	1938	1937	1938	1937	1938	1937	1938	1937
Jan. 1	62.7	96.6	21.0	79.0	1,998	2,069	457,359	587,953	49,550	71,800
Jan. 8	70.1	107.8	26.0	79.5	2,139	2,244	552,314	698,529	54,084	96,780
Jan. 15	74.4	106.7	29.0	79.0	2,113	2,264	550,600	700,238	65,735	91,685
Jan. 22	74.7	104.0	30.5	80.0	2,108	2,256	570,333	670,376	65,418	81,395
Jan. 29	73.8	99.6	33.0	76.0	2,098	2,214	553,176	659,790	59,365	74,148
Feb. 5	70.9	100.8	31.0	79.5	2,082	2,201	564,740	675,026	51,443	72,295
Feb. 12	71.2	101.9	30.0	81.0	2,052	2,199	542,991	691,618	57,810	72,850
Feb. 19	71.9	108.8	31.0	83.0	2,059	2,211	535,790†	714,884	59,100	95,698
Feb. 26	70.3*	112.8	30.5	84.0	2,031	2,207	512,215*	696,727	56,977	111,915

*Preliminary. †Revised.

TREND

Key:	Jan. 1938	Key:	Jan. 1938	Key:	Jan. 1938	Key:	Jan. 1938
1	$9.77*	5	19,200,000	9	29,631	13	34.2
2	228,074	6	$25,971,525*	10	$319,756,000*	14	76.8
3	66,626	7	586,102	11	$208,863,000*	15	129.6
4	46,426	8	518,322	12	81	16	25

*December.



Key: 1. Bradstreets' Index (Average of Wholesale Commodity Prices. 2. Automobile Production in United States and Canada, compiled by U. S. Department of Commerce. 3. Average Daily Steel Ingot Output, compiled by American Iron and Steel Institute. 4. Average Daily Pig Iron Output, compiled by STEEL. 5. Building Construction, Contract Awards in 37 States, compiled by F. W. Dodge Corp. 6. Railroad Earnings, Net Operating Income for Class I Roads, compiled by Bureau of Railroad Economics. 7 and 9. Iron and Steel Foreign Trade, reported by Bureau of Foreign and Domestic Commerce. 8. Shipments of Finished Steel, United States Steel Corp. 10 and 11. Foreign Trade, Value of Exports and Imports, reported by Bureau of Foreign and Domestic Commerce. 12. Index of Industrial Production (adjusted for seasonal variation; average 1923-25=100) computed by Federal Reserve Board. 13. Blast Furnace Production Rate, compiled by STEEL. 14. Index of Foundry Equipment Orders (Average 1922-24=100), compiled by American Foundry Equipment association. 15. Index of Machine Tool Orders (Three-month moving average; average monthly shipments 1926=100), compiled by National Machine Tool Builders association. 16. Railroad Freight Car Orders, compiled by STEEL.

First Convention and Show Is Fruition Of Early Efforts by Founders of Tool Engineers' Society

By FRANK A. SHULER
President
American Society of Tool Engineers

■ WITH ITS first annual membership convention and the coincident Machine & Tool Progress exhibition, March 9-12, the American Society of Tool Engineers becomes the national institution first conceived when the society was formed in 1932.

Perhaps to many, those days during the depths of the depression may have seemed a most inappropriate time to start something new. A group of production men from Detroit plants, however, recognized that the readjustments which recovery would make necessary to meet the nation's changing economics inevitably would impose on manufacturing an increasing necessity for more intelligent planning and a better understanding of the possibilities inherent in new processes, new methods and new tools. They recognized, further, a greater interchange of ideas would have to be established between men engaged in producing goods in large quantities.

They assembled—33 of them—one cold winter evening in January at the Detroit College of Applied Science and laid down the cornerstones for the present nation-wide organization, the American Society of Tool Engineers, a tool engineer being defined as:

1. A man of recognized ability, able to plan the order of operations, to lay out, supervise the design and manufacture of tools and equipment.

2. A tool, die, or machine designer having at least five years experience.

3. An executive possessing knowledge of tool engineering for mass production.

The purpose of the A.S.T.E. was set down as: "to advance, promulgate and further the arts of tool engineering among the membership of the society; to bring good fellowship, fraternity and the spirit of brotherhood among the members; to hold readings and discussions on professional papers and reports at meetings called for that purpose; to publish and disseminate such papers and reports to the members. . . ."

During the three years that followed, growth of the A.S.T.E. was slow. Production men are not natural "joiners." In 1935 A.S.T.E. membership, still confined to Detroit, numbered around 400.

By the fall of 1935, reports of society activities had penetrated to other parts of the country. Group after group from other cities requested information as to the possibility of forming local chapters.

First of the chapters to be formed outside Detroit was the Racine, Wis., chapter, established in October, 1935. Cleveland followed in December, Milwaukee in April. From then on, city after city came into the fold through the northeast and middlewest. By November, 1937, 14 chapters had been formed, and half a dozen more groups in other towns were planning organization meetings so that charters might be obtained.

Though the society's growth in 1936 was rapid, in 1937 both membership and number of chapters doubled, and only recently three more chapters have been chartered—Philadelphia chapter of 60 members was chartered as the fifteenth in the society Feb. 24; Rochester, N. Y., with 64 members, was chartered Feb. 25; and St. Louis, with 50 members, received its charter as the seventeenth chapter on March 3.

In its setup, the A.S.T.E. is unusual in that it is operated by its membership. Each local chapter of the society is self-sustaining, and self-managed. There are 33 directors —corresponding in number to the

National President

Frank A. Shuler

■ Has served the society as director, first vice president and for the last year as president. Starting his career in 1907 with Timken Axle Co., Canton, O., he was transferred to Detroit as master mechanic of the company's branch there. He is now master mechanic at the Highland Park plant of Chrysler Corp., and is well known for his work in rear axle housing fabrication methods. During his year at the helm of the A.S.T.E., the society has doubled in size, adding seven new chapters. His has been the directing force behind the society's first attempt at exhibition-holding.

exact number which formed the original group—elected by the membership and including chapter chairman. The directors in turn elect the national officers, who govern the society as a national body.

This year, in laying plans for the first membership convention of the entire society, the board of directors also decided to stage an enducational exhibition for members—and nonmembers—of the society in industry at large.

Manufacturers of production equipment of all kinds, used in mass production industries were invited to join in this co-operative effort with exhibits of their tools, machines, processes and the like. Short as was the time between the formulation of these plans and the show itself—not much over 60 days—about 150 manufacturers and their representatives took advantage of the opportunity of giving production men a better understanding of what is available to them to enable them to do a better job, today and tomorrow.

Coincident with the show, the technical program for the annual meeting is designed to be highly educational in character. Forums on technical subjects, permitting the expressing of all viewpoints on problems of primary importance to tool engineers right now, replace the more conventionalized presentation of a mass of technical papers on unrelated subjects. Arrangements have been made to enable attending tool engineers to visit and inspect dozens of plants in the Detroit area, ranging from tool and die shops to the largest of the mass production factories.

The whole program—exhibition, technical sessions and plant tours—has been timed to precede the start of most major 1938 tooling and equipment programs. The society is fortunate in having intimate knowledge of plans for such new programs directly through its membership; as a result, the membership and industry at large are being given an opportunity to bring themselves up-to-date on latest developments before the new programs actually get under way. We hope and anticipate that by this means we will be able to contribute something to an even better planning of tooling programs during the coming season.

We do not feel such a program should be limited to our membership. In the hope that the maximum of goodwill may come from these activities throughout industry, a cordial invitation is extended to every tool engineer, process man, or any other individual responsible for production in any way, to attend this annual meeting and show.

Indications are that large groups from the various chapters will be in attendance. Special trains will be run from Pittsburgh, and also from Buffalo-Rochester for chapter members visiting Detroit.

First Vice President

Luke E. Beach

■ Has been active with the society since its inception, as director, second vice president, and for the past year first vice president. His early training as a tool engineer was received in apprenticeship work at Burroughs Adding Machine Co., Detroit, following which he was active in toolmaking and tool designing fields. Becoming assistant chief tool designer at Cadillac Motor, he later transferred to Lincoln Motor as chief tool designer and assistant superintendent of tools. After a short period with Cadillac again as tool engineer, he transferred to Packard Motor where for four years he has been processing engineer and lately supervisor of processing.

Program for Convention and Exhibition

Wednesday, March 9

9:00 a.m. Exhibit opens in Convention hall.
9:30 a.m. Plant inspection trips (see list of scheduled visitations).
1:30 p.m. Plant inspection trips.
1:30 and 3:00 p.m. Motion pictures in Convention hall annex.
"The Story of the Tire"
"The Inner Tube"
"New Way Farming"
6:00 p.m. Smorgasbord dinner in Convention hall annex.
Opening ceremonies with welcome from Richard W. Reading, mayor of Detroit.
8:00 p.m. Technical session in Convention hall annex.
Chairman: J. R. Weaver, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
Subject: "Preparing Standards for Surface Quality," introduced by Dr. E. J. Abbott, president, Physicists Research Co., Ann Arbor, Mich.
Discussion: Engineering Viewpoint, by Harry T. Woolson, executive engineer, Chrysler Corp., Detroit.
Shop Viewpoint, by R. V. Hutchinson, Olds Motor division, Lansing, Mich.; and F. J. Malone, assistant to president, Hercules Motor Co., Canton, O.
10:00 p.m. Exhibit closes.

Thursday, March 10

9:00 a.m. Exhibit opens.
9:30 a.m. Plant inspection trips.
12:30 p.m. Board of directors' luncheon at Fort Shelby hotel.
1:30 p.m. Board of directors' annual meeting at Fort Shelby hotel.
1:30 p.m. Plant inspection trips.
1:30 p.m. and 3:00 p.m. Motion pictures in Convention hall annex.
"The Making of Steel"
"The San Francisco-Oakland Bay Bridge"
8:00 p.m. Technical session in Convention hall annex.
Chairman: J. R. Weaver.
Subject: "Selecting and Buying Equipment," introduced by Edwin Johnson, manager of cost studies, Packard Motor Car Co., Detroit.
Discussion: Shop Viewpoint, by P. W. Brown, general factory superintendent, Wright Aeronautical Corp., Paterson, N. J.
Purchasing Viewpoint, by Tom Higgins, purchasing agent, General Electric Co., Schenectady, N. Y.
Suppliers' Viewpoint, by A. H. d'Arcambal, Pratt & Whitney division of Niles-Bement-Pond Co., Hartford, Conn.
10:00 p.m. Exhibit closes.

Friday, March 11

9:00 a.m. Exhibit opens.
9:30 a.m. Plant inspection trips.
1:30 p.m. Plant inspection trips.
1:30 p.m. and 3:00 p.m. Motion pictures in Convention hall annex.
"Petroleum, The Liquid Mineral"
"The Shenandoah National Park"
"Follow the White Traffic Marker"
6:00 p.m. Exhibit closes.
6:30 p.m. Annual dinner at Hotel Statler.
Reports of national officers.
Installation of new officers.
"The Tool Engineer," an address by Ralph Flanders, president, Jones & Lamson Machine Co., Springfield, Vt.
Entertainment.

Saturday, March 12

9:00 a.m. Exhibit opens.
1:30 p.m. Orchestra in Convention hall annex.
Special attractions.
6:00 p.m. Finale. Exhibit closes.

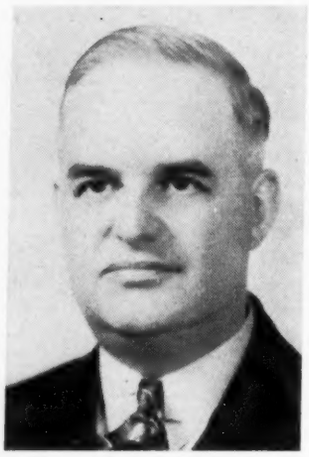
Leading Personalities in Tool Engineers' Society

Second Vice President

Walter F. Wagner

■ Has served with the A.S.T.E. as director before his present post. Started his career in 1906 with E. R. Thomas Motor Co., Buffalo, as apprentice in the engineering department, and in 1909 went to Detroit with Ford's tool design department. Then for three years he was associated with Northway Motor Co., following which he gained further experience at Cadillac, Studebaker, Maxwell and Oakland, afterward becoming chief tool designer at Hudson, this in 1920. When Ford acquired Lincoln, he returned to the latter company, now being mechanical superintendent.

National Secretary



C. Ray Brunner

■ Has held this post with the A.S.T.E. for the past two years. Following itinerant apprenticeship in machine shops in Indiana, he went to Flint, Mich., as assistant toolroom foreman for Chevrolet, later being transferred to tool designing. Removing to Detroit, he engaged in tool designing for Cadillac and at Northway Motors. For a year he was production foreman at the Dodge Ordinance department, and for the past 15 years has been with the Dodge main plant, first as a tool designer and later as tool engineer, specializing on problems in connection with engine tools.

Executive Secretary

Ford R. Lamb

■ A pioneer in the A.S.T.E. ranks, he has served as director, vice president and president, becoming executive secretary in May, 1937. He has been engaged in the tool engineering profession for 20 years and is an inventor of several mechanisms used in this field — particularly devices for stud setting. By his own admission, he "plays a rotten game of golf, but shoots a mean gun on pheasants and rabbits." A convincing public speaker, he has given untiring effort to the building of the A. S. T. E. to its present eminence as a national technical society.

National Treasurer

Frank R. Crone

■ A charter member of the A.S.T.E., he has served on the board of directors and numerous committees. Prior to the World war he served as tool designer and engineer for such companies as Doble Steam Car, Saxon Motor, Studebaker, Cadillac and Maxwell, and after serving in the air force overseas he returned to Detroit to become associated with the tool designing department of Lincoln, where he now holds the position of chief tool designer.

Wide Choice of Plant Visitations Arranged

■ Inspection trips have been scheduled to a number of plants in the Detroit district, including the following:

Cadillac Motor Division
Champion Spark Plug Co.
Chrysler Corp. and Divisions
Ford Motor Co.
Great Lakes Steel Corp.
Hudson Motor Car Co.
Packard Motor Car Co.
Thompson Products Inc.
Timken-Detroit Axle Co.
United States Rubber Co.

In addition to the above, arrangements have been concluded to visit about 25 smaller plants in the tool and die, special machinery, engineering and similar fields. Numerous other plants in this category can be visited by arrangement with the committee in charge; Charles F. Staple is chairman.

First President

J. A. Siegel

■ A charter member of the A. S. T. E. and a moving force in the organization since its birth, he has devoted nearly 30 years to tool engineering and manufacturing. Becoming associated with Packard, he has held positions as tool designer, gage engineer, tool standards engineer and assistant tool and die designer. A staunch advocate of standardization, he has served on several national committees engaged in this work, particularly with gages.

Exhibitors in Machine and Tool Progress Show

Convention Hall, Detroit, March 9-12

A

ABRASIVES, Cleveland 338
Publications and technical books.

Allen Mfg. Co., Hartford, Conn. 272
Set screws; cap screws; pipe plugs.

American Equipment Co., Detroit 341
Air valves, cylinders; pumps; hydraulic units.

B. C. Ames Co., Detroit 248
Dial micrometers; precision machinery.

Apex Machine & Tool Co., Dayton, O. 231
Tools; wrenches; chucks; tool holders.

Automotive Maintenance Machinery Co., Chicago 181
Crank shaper; wrenches; crankpin tool.

B

Barber-Colman Co., Rockford, Ill. 315, 354
Small tools; cutters; hobs; reamers.

Barker Tool, Die & Gage Co., Detroit 218
Tools; dies; gages.

Barrett-Cravens Co., Chicago 380
Lift trucks; skids; portable elevator.

John Bath & Co. Inc., Worcester, Mass. 155
Taps; thread gages.

G. S. Blakeslee & Co., Chicago 221
Solvent degreasing machines.

Boyer-Campbell Co., Detroit 224, 225
Chucking, tapping equipment; precision grinders.

Bradley Machinery Co., Detroit 189B
Lathe; drill press.

Bristol Co., Waterbury, Conn. 365
Set screws; cap screws; steel belt lacing.

Brown & Sharpe Mfg. Co., Providence, R. I. 245
Small tools; milling cutters; magnetic chuck.

Charles Bruning Co. Inc., Detroit 230
Printing process for drafting work.

Buell Die & Machine Co., Detroit 370
Grinder set up on jig borer.

C

Andrew C. Campbell Division, American Chain & Cable Co., Bridgeport, Conn. 260
Abrasive cutoff machines; nibbling machines.

Carboloy Co. Inc., Detroit 229
Cemented carbide tools and dies; wheel dressers.

Chicago Pneumatic Tool Co., New York 379
Pneumatic and electric tools.

Chicago Rivet & Machine Co., Chicago 154
Riveting machines; rivets.

Colonial Broach Co., Detroit 243
Broaches.

Continental Machine Specialties Inc., Minneapolis 337
Precision filing, sawing and polishing machines.

Cushman Chuck Co., Hartford, Conn. 343
Manual and power-operated chucks.

D

DAILY METAL TRADE, Cleveland 338
Publications and technical books.

Dalrae Tool Co., Syracuse, N. Y. 188
Small tools.

Danly Machine Specialties Inc., Chicago 291
Die sets and set-up equipment.

Davis Boring Tool Division, Larkin Packer Co. Inc., St. Louis 357
Boring tools; facing tools; reamers.

Dayton Rogers Mfg. Co., Detroit 317
Pneumatic die cushions.

Delta Mfg. Co., Milwaukee 228
Drill presses; tapping attachments.

Detroit Area Associated Machine & Tool Distributors, Detroit 186

Detroit Tap & Tool Co., Detroit 244
Thread cutting tools; gages.

Detroit Testing Machine Co., Detroit 187
Testing equipment.

Duplex Equipment Co., Detroit 371
Jigs; index table; drill heads; chucks; bushings.

E

Eclipse Counterbore Co., Detroit 340
Counterbores; countersinks; core drills; cutters.

Electronic Control Corp., Detroit 180
Photoelectric control devices.

Esco Engineering Service, Detroit 185

Ettco Tool Co. Inc., Brooklyn, N. Y. 325
Drill chucks; tappers; drill heads.

Exact Weight Scale Co., Columbus, O. 369
Scales.

Ex-Cell-O Corp., Detroit 296
Cutting tools; drill jig bushings; ground threads; grinding spindles.

F

J. N. Fauver Co. Inc., Detroit 339
Regulating valves; hose assemblies; tubing; lubricating devices.

Federal Products Corp., Providence, R. I. 344
Dial indicators, gages; measuring instruments.

Ford Motor Co., Johansson Gage Division, Dearborn, Mich. 360
Gage blocks.

Fostoria Pressed Steel Corp., Fostoria, O. 249
Machine tool lamps; coolant filters.

THE FOUNDRY, Cleveland 338
Publications and technical books.

Frick-Gallagher Mfg. Co., Wellston, O. 359
Bins and steel shelving.

G

Gairing Tool Co., Detroit 309
Counterbores; core drills; tool holders; cutters.

General Electric Co., Schenectady, N. Y. 353
Motors and controls.

James W. George, Detroit 217
Machinery.

Goddard & Goddard Co. Inc., Detroit 330
Milling cutters; reamers; boring and facing tools.

Goodspeed Detroit Co., Detroit 364
Speed lathes; drill presses; drill chucks; mandrels; reamers; milling cutters.

Gorham Tool Co., Detroit 300
High speed steel cutting tools.

Greenfield Tap & Die Corp., Greenfield, Mass. 253
Taps; dies; drills; screw extractors; reamers; gages; screw plates; pipe tools.

Grinding Machinery Co., Detroit 347
Coolant pumps; demagnetizers; grinders; lapping machines; abrasive cutoff machine; gage blocks; comparator.

Grob Bros., Grafton, Wis. 268
Metal cutting bandsaws; filing machines.

H

Hamilton Mfg. Co., Two Rivers, Wis. 157

Hamilton Tool Co., Hamilton, O. 368
Small tools; elevating trucks.

Hannifin Mfg. Co., Chicago 298
Riveting equipment.

Haynes Stellite Co., Detroit 323
Cutting tools; wear and corrosion resistant alloys.

Hobart Bros. Co., Troy, O. 247
Arc welding equipment.

Hole Engineering Service, Detroit 278
Bearing tools; drilling units; honing equipment; boring and grinding spindles; grinders.

Holo-Krome Screw Corp., Hartford, Conn. 318
Set screws; cap screws; pipe plugs; wrenches.

Hydraulic Press Mfg. Co., Mt. Gilead, O. 233
Plastic molding machinery.

I

Illinois Tool Works, Chicago 333
Gear measuring machines; testing machines; lock washers.

Index Machinery Corp., Cincinnati 352
Injection molding machine.

International Nickel Co. Inc., New York 355
Tools and products containing nickel.

J

Jacobs Mfg. Co., Hartford, Conn. 320
Drill chucks.

Charles L. Jarvis Mfg. Co., Middletown, Conn. 232
Flexible shaft machines for sanding, grinding, filing, polishing.

Jennison-Wright Co., Toledo, O. 366
Wood block flooring; piling; oil, paint.

Jig Bushings Co., Detroit 252
Jig and fixture accessories.

Jones-Fors Co., Detroit 232
Portable grinders, drills; chucks; vise jaws.

Jones & Lamson Machine Co., Springfield, Vt. 376
Comparators.

K

Koebel Diamond Tool Co., Detroit 149
Diamond tools.

H. R. Krueger & Co., Detroit 328
Small tools.

L

Lee Machinery Co., Detroit 255
Lathes.

Leland-Gifford Co., Worcester, Mass. 251
Drill bushings; hardened and ground parts.

LeMaire Tool & Mfg. Co., Dearborn, Mich. 270
Hydraulic units; gear chucks, gages; drilling machines.

Lincoln Engineering Co., St. Louis 189A
Lubrication equipment; grease guns.

Link Engineering & Mfg. Co., Detroit 314
Testing devices for coil springs.

John E. Livingstone Co., Detroit 297
Machinery.

Lufkin Rule Co., Saginaw, Mich. 277
Precision tools.

M

M-B Products, Detroit 152
Pneumatic tools; lubrication devices.

MACHINE DESIGN, Cleveland 338
Publications and technical books.

Manufacturers' Sales Co., Detroit 292
Grinders; screw drivers; trucks and casters; flexible-shaft machines; hoist; tapers.

Marburg Bros. Inc., New York 223
Precision jig borer.

McCaskey Register Co., Alliance, O. 222
Registering devices.

McCrosky Tool Corp., Meadville, Pa. 262
Milling cutters; reamers; drill chucks; turrets.

Michigan Association of Used Machinery Dealers, Detroit. 220

Michigan Tool Co., Detroit 294
Gear shaving machines; cone gears; cutting tools.

Micromatic Hone Corp., Detroit 275
Honing equipment.

Midwest Tool & Mfg. Co., Detroit 263
Milling cutters; counterbores; reamers; cutting tools; holders.

Minster Machine Co., Minster, O. 156
Presses.

Modern Collet & Machine Co., Ecorse, Mich 283
Springs; collets; cams; spindles; screw machines and accessories.

Morse Tool Co., Detroit 246
Form tools; reamers; boring bars; cutting tools.

N

National Tool Salvage Co., Detroit 258

Nicholson File Co., Providence, R. I. 313
Files and rasps.

O

O. K. Tool Co. Inc., Shelton, Conn. 326
Tool holders; milling cutters.

Ozalid Corp., New York 192A
Machine for black and white drafting prints.

P

Parker-Kalon Corp., New York 192A
Screws; holding devices.

Penton Publishing Co., Cleveland 338
Publications and technical books.

Peters Tool Co. Inc., Milwaukee 356
Vertical oscillatory grinder.

George H. Pfeil Inc., Detroit 182
Steel wire stitching machinery.

Pioneer Engineering & Mfg. Co., Detroit 336
Coolant and lubricant pumps.

Pratt & Whitney Division, Niles-Bement-Pond Co., Hartford, Conn. 299
Tools and gages.

H. P. Preis Engraving Machine Co., Newark, N. J. 358
Engraving machine; die sinkers; milling machines.

Progressive Welder Co., Detroit 158
Portable welding guns; punching equipment.

Putnam Tool Co., Detroit 257
Cutting tools; grinding fixtures.

Pyro-Electro Instrument Co., Dearborn, Mich. 319
Hardness testing machines.

Q

Q C Engineering Products Co., Detroit 345
Drill jigs; fixture accessories; centers; index tables; control valves.

R

Racine Tool & Machine Co., Racine, Wis. 219
Metal cutting machinery.

T. B. Rayl Co., Detroit 322

Reed-Prentice Corp., Worcester, Mass. 375
Injection molding machine.

Robbins Engineering Co., Detroit 259
Magnetic chucks.

Ross Operating Valve Co., Detroit 242
Air control valves.

S

George Scherr & Co., New York 348
Gages; testing equipment; chucks.

A. Schrader's Son Division, Scovill Mfg. Co. Inc., Brooklyn, N. Y. 362
Blow valves; blow guns; spray guns; air line fittings; safety controls; pressure gages.

Scully-Jones & Co., Chicago 367
Reamers; counterbores; drill and tap drivers.

Sheffield Gage Corp., Dayton, O. 189B
Gages.

Siewek Tool Co., Detroit 190A

Singer Sewing Machine Co., Detroit 150
Industrial sewing machines.

J. T. Slocomb Co., Providence, R. I. 327
Micrometers; drills; countersinks.

Socony-Vacuum Oil Co., Detroit 350
Industrial lubricants and coolants.

Standard Shop Equipment Co., Philadelphia 230
Job set-up equipment.

Stanley Electric Tool Division, Stanley Works, New Britain, Conn. 191B
Portable electric tools.

L. S. Starrett Co., Athol, Mass. 321
Precision tools; dial indicators; hacksaws; steel tapes.

STEEL, Cleveland 338
Publications and technical books.

Stoker Unit Corp., Milwaukee 267
Precision boring machine.

Charles A. Strelinger Co., Detroit 324
Machinery and tools.

Strong, Carlisle & Hammond Co., Cleveland 184
Hardened and special screws.

D. A. Stuart Oil Co., Chicago 234
Metalworking oil products.

Super Tool Co., Detroit 183
Tools.

Sutton Tool Co., Detroit 264
Collets; screw machine accessories; feeders.

Swartz Tool Products Co. Inc., Detroit 310
Fixtures; fixture accessories.

T

Taft-Peirce Mfg. Co., Woonsocket, R. I. 378
Gages; magnetic chucks; small tools.

Thomas Machine Mfg. Co., Pittsburgh 362
Power presses; feeding devices.

Toledo Scale Co., Toledo, O. 346
Scales.

Tomkins-Johnson Co., Jackson, Mich. 331
Air and hydraulic equipment; coolant pumps; cutters; collet chucks; rivet setter.

Triplex Machine Tool Corp., New York 273
Jig boring machine attachments; gear grinding and testing machines.

V

Vickers Inc., Detroit 290
Hydraulic controls; hydraulic pumps.

W

Webster Mfg. Co., Detroit 374
Conveying and power transmission equipment.

Wells Mfg. Corp., Three Rivers, Mich. 153
Metal bandsaws.

Wesson Co., Detroit 311
Grinding machine; cutting tools.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. 293
Welding equipment; instruments; lighting; motors and controls.

Wetmore Reamer Co., Milwaukee 237
Machine reamers; boring bars; special tools.

Whitehead & Kales Co., River Rouge, Mich. 250
Welded steel products.

J. H. Williams Co., Buffalo 361
Drop forged tools.

Wilson Mechanical Instrument Co., New York 372
Hardness testing equipment.

Z

Carl Zeiss Inc., New York 301
Measuring instruments; metallographic apparatus; spectrograph.

Birmingham Foundry Conference on Cupola Sets Attendance Record

■ ATTENDANCE records for a regional foundry conference were broken at the sixth annual foundry practice meeting held in Birmingham, Ala., Feb. 24-25, under the joint sponsorship of the Birmingham District chapter of the American Foundrymen's association and the Birmingham section of the American Society of Mechanical Engineers. A total of 625 foundrymen and engineers, representing 15 states, registered for the two-day meeting.

The program featured four technical sessions, a luncheon, a dinner and a morning devoted to plant visitations. The four technical sessions constituted a symposium on the mechanics of the cupola and its auxiliary equipment with each devoted to a specific phase.

Hyman Bornstein, director of testing and research laboratory, Deere & Co., Moline, Ill., and president, American Foundrymen's association was the speaker at the luncheon. He reviewed work of the association and reported that because of success of the chapter movement membership in the A.F.A. is at the highest point in its history.

The first session was devoted to "Design, Construction and Maintenance" of the cupola. W. L. Roueche Sr., McWane Cast Iron Pipe Co., Birmingham, in a paper "The Balanced Blast Cupola," stated that the main difference between the conventional cupola and the balanced blast unit has to do with stack dimensions and the tuyere design and arrangement. The tuyere system consists of one row of main tuyeres entering the lower level of the bed and two or three rows of auxiliary tuyeres admitting a measured amount of air into the upper levels. Main tuyeres are equipped with special valves permitting close regulation of air; auxiliary tuyeres also are adjustable. Number and size of main and auxiliary tuyers vary with cupola size, according to Mr. Roueche.

The speaker pointed out that when the furnace is put into operation, proper setting for auxiliary tuyeres is determined, and that setting is not altered except for material change in character of burden or coke quality. Valves on main tuyeres have gates which permit closing each tuyere for 8 to 10 minutes in consecutive order without changing the setting. This permits chilled iron or slag to melt away and keeps tuyeres open and free, prevents bridging and insures a clean drop, according to Mr. Roueche. Cupolas of balanced blast type are operating successfully on daily heats up to 24 hours. The speaker said main advantages are more economical melting, increased tapping temperature, improved quality of metal as result of lower sulphur pickup, and better melting conditions.

Reviews Hot Blast Development

J. W. Cotlin, American Cast Iron Pipe Co., Birmingham, described the "Acipco Hot Blast Cupola." To meet special melting conditions, this company some years ago adopted the idea of passing the blast through cast-iron sections set in the cupola wall below the charging door and above the melting zone. After use of that type of equipment about 8 years, increased demands on melting capacity resulted in replacement of the iron castings with a series of U tubes. In this unit, cold air comes into an upper bustle pipe, passes down through the tubes to a lower bustle pipe and then through cast-iron downcomers to the tuyeres. The melting zone is lined with refractory blocks up to the bottom of the tubes. Standard 9-inch bricks are used between tubes and shell. Above the tubes are used iron bricks which, with hot blast equipment, are claimed not to be subject to extreme temperature conditions.

Safety devices cut out any part of the equipment should leaks develop. Mr. Cotlin stated that a series of heats, ranging from 3 to 16 hours each, has indicated average life of the hot blast tube to be approximately 150 heats. Operating the cupola on alternate days affords ample time for ordinary repairs and tube replacement. Ordinarily, repairs and replacements are made in about 3 hours by four men. The cupola is claimed to be flexible and may be operated through short shut-down periods and melting rate can be varied widely without appreciable temperature loss. Present cupolas are operated with an iron to coke ratio between charges of from 10 to 1 and 12 to 1. On the old cold blast cupolas, the company used a coke ratio of 7½ to 1. The speaker pointed out this represents an average saving of about 30 per cent in coke charge.

The "Griffin Hot Blast Cupola" was discussed by L. H. Rudesill, Griffin Wheel Co., Chicago, who described the mechanism of the heater installed on a standard cupola. An exhaust fan controls and draws air through the heater; gas is taken from the cupola to a combustion chamber and burned at 1600 degrees Fahr. It then is passed through to a set of cast iron tubes

and is exhausted into the atmosphere at 500 degrees Fahr. Cold air, delivered by positive-pressure blower, enters the heater at the point where the hottest gases are conducted from the combustion chamber. This keeps the iron plate separating the gases from the air below 1000 degrees Fahr. and prevents warping. Air passes around the gas tubes, through a chamber and around a second set of tubes and enters the cupola at 600 degrees Fahr.

The heater is constructetd entirely of metal, with exception of the lining for the combustion chamber. Records over a 10-year period show a total of coke saving of 185 pounds per ton of metal melted, and between charges of 145 pounds per ton of metal. These data indicate, according to Mr. Rudesill, that saving in coke has been 39½ cents per ton of product.

In discussing the "Plain Cupola," Clyde Hagler, Continental Gin Co., Birmingham, stated that in small foundries where the melt is 20 tons per day or less, the plain cupola appears to be better suited than those using hot blast. Mr. Hagler described the construction and operation of the cupola, dwelling particularly upon the tuyeres. In his opinion, area of cupola tuyeres to that of cupola cross section should be from 1 to 4, to 1 to 6 for good operation. He stated that few small cupolas use more than one row of tuyeres. In his opinion, height of a charging door above the bottom plate in hand charged cupolas should be from 12 to 15 feet and in machine charged units, from 18 to 20 feet

Temperature Can Be Maintained

All the papers were discussed as a unit. Replying to a question, Mr. Roueche stated it would be possible in the balanced blast cupola to maintain throughout the heat the high temperature which now is secured during the first half hour. The first four charges use a coke ratio of 10 to 1; after that the ratio is 15 to 1. High temperature is employed at the beginning to heat the cupola quickly. Mr. Roueche also stated that balanced blast cupolas can be operated at 2800 degrees Fahr.; a unit in Utah has been operating for some time on an average of 2750 degrees Fahr.

Regarding advantages of using a hot blast or balanced blast unit for heats as short as 2 hours, it was stated that the Acipco unit was designed for long heats where a saving of approximately 30 per cent would be effected. Data on a 3-hour heat show a saving of about 12 per cent. In the Griffin hot blast, greatest efficiency starts after 30 minutes; during the first half hour, the efficiency increase is about 10 per cent. In the balanced blast cupola, it is claimed a decided increase in efficiency and a saving in coke is obtained in short heats. Normal melting rate is considerably higher than on the regular cupola of equal size.

A. W. Gregg, Whiting Corp., Harvey, Ill., contended the greatest saving in use of a hot blast unit is not in coke but in reducing oxidation. Replying to a question as to whether a hot blast unit has been hooked up with a balanced blast cupola, F. C. Herbster, Sheffield Steel Corp., Kansas City, Mo., stated that an installation was being made whereby a Griffin hot blast unit was being built with a balanced blast cupola. The furnace will provide hot metal for an open hearth furnace.

Air Volume Is Controlled

It was brought out that a balanced blast cupola has been operated where melting rate has varied as much as 30 per cent per day. In changing the rate, it was not necessary to change upper or lower tuyeres but simply to change the volume of air introduced in the windbox. It was also stated that tuyeres enter the cupola at an angle of 90 degrees to the shell, and have no down rake. One balanced blast cupola now is operating 24 hours at a time and is exceptionally free from bridging. When it is necessary to shut down that type of cupola from a short period to as much as 3 hours, the temperature comes back promptly. Considerable difference of opinion developed as to the value of a double row of tuyeres.

The afternoon session was devoted to "Cupola Charging Equipment." Waldeck Levi, Lynchburg Foundry Co., Radford, Va., presenting a paper, "Mechanical Cupola Charging in the Cast Iron Pipe Industry," described the Shepard equipment used in charging four cupolas in his company's pipe plant. Mechanization of the charging operation required installation of an iron yard crane and magnet for loading cupola charges, an electric charging crane complete with nine charging buckets of special design, cutting a hatchway 31 x 15 feet in the charging floor and enlarging the charging door openings in the cupola. Cupolas also were equipped with front slagging spouts.

Two teapot mixing ladles have been installed, so arranged that one or two cupolas can be tapped at the same time. All of the metal is treated in the mixing ladles with fused sodium carbonate. Slag is run into a stream of water which breaks it up and carries it to hopper cars behind the furnaces. The speaker stated that mechanical charging, in addition to reducing the number of men required, has made the charging operation considerably more pleasant. Furthermore, operators can clean house on the charging floor. These factors, he believes, contribute to more uniform and more efficient cupola operation.

A. W. Gregg, Whiting Corp., Harvey, Ill. discussed the "Whiting Wish-Bone Charger", and stated the great advantage of mechanical charging is in saving of labor. Furthermore, because of more comfortable working conditions and less fatigue, mechanical charging will provide a more uniform job of charging. It was stated that the cone bottom discharge requires a clearance of 10 inches between the bucket and the inside cupola diameter, which means the inside diameter of a cupola must be 52 inches to utilize that type of equipment. A 42-inch cupola may be equipped with a drop bottom bucket since only 5 inches clearance is necessary between the cupola and the bucket. Advantages to be gained by use of a mechanical charging system are by no means theoretical; many installations have paid for themselves in a year or less.

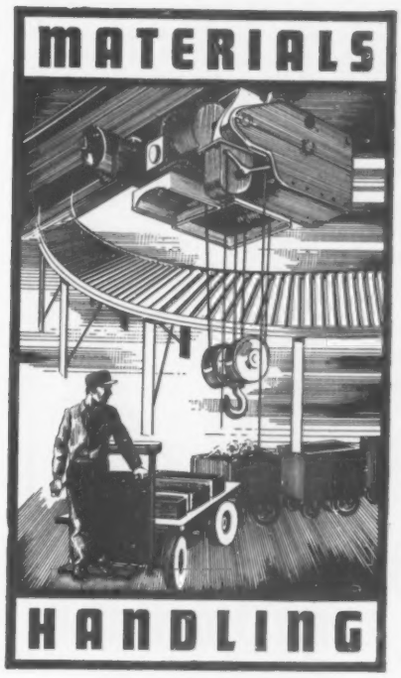
Combination of mechanical hand charging was described by Victor Szwed, U. S. Pipe & Foundry Co., Birmingham, in a paper, the "Dump Charger". The plant is equipped with a double parallel crane runway, and stock is handled to the cranes on a narrow-gage railway. Trays are loaded with various grades for the charge, and are picked up and carried to the charging floor where they are placed on a chute built 45 degrees to horizontal. The top of the tray is attached to the chute and as the tray is lowered, the material is discharged into the chute and is carried to the charging door.

Making Up the Charges

Shipments of iron are so arranged that the iron is used directly from the cars. This same is done with purchased scrap iron. However, supplies of both iron and coke are maintained in the yard for emergencies. Coke is delivered on schedule and charges are measured by volume. Coke is hand charged. Limestone is unloaded between the dual runways, delivered to the charging platform on pans, and is hand charged. In the beginning, the cupola is charged to the level of the charging door by hand; subsequently it is charged through the chute.

Dan Guldberg, American Cast Iron Pipe Co., Birmingham, discussed the "Acipco Charger." In this installation, raw materials are handled in a charging box which is raised from the iron yard level by an overhead high-speed crane. The box is placed on a charging machine on the charging floor, and so de-

(Please turn to Page 79)



J. A. CRONIN, Materials Handling Editor

Modernization

Even in an old building there is slight excuse for an outdated materials handling system. This plant profited well by modernization

By MIRT RADY

Superintendent
Gilbert & Bennett Mfg. Co.,
Blue Island, Ill.

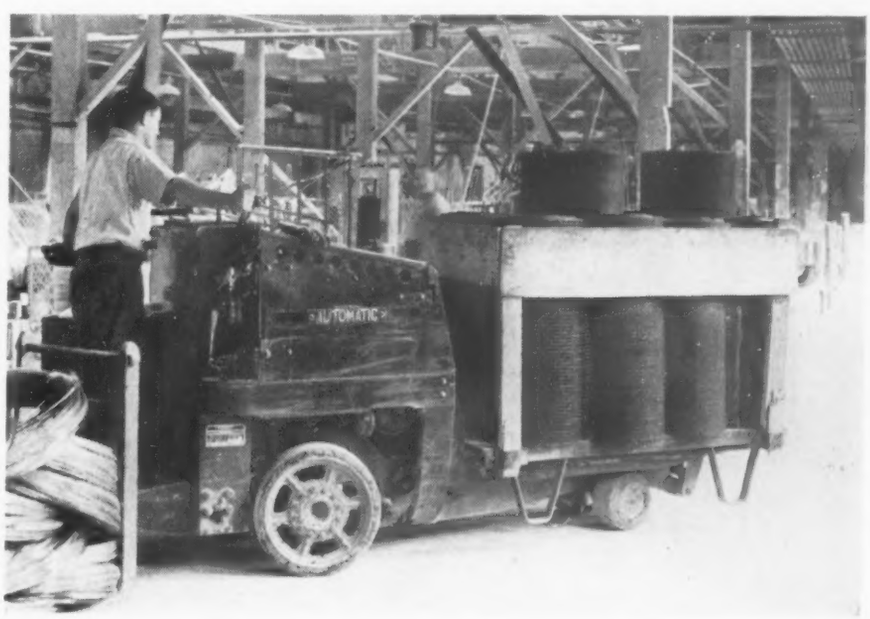
■ MODERNIZATION of materials handling is often considered impossible in connection with an old plant. The statements, "If we were going into a new building . . ." or "If we could rearrange everything . . ." are frequently given as an excuse for continuing an outmoded materials handling method.

The Gilbert & Bennett plant, which is engaged in drawing wire and weaving it into chicken fencing or netting and hardware cloth, is 44 years old. About a year ago the method of handling materials in part of the plant was changed to a more modern system. No general rearrangement of the plant or production equipment was made, except laying a new floor and moving one department from the second to the first floor, a rearrangement which would have produced advantages under any circumstances.

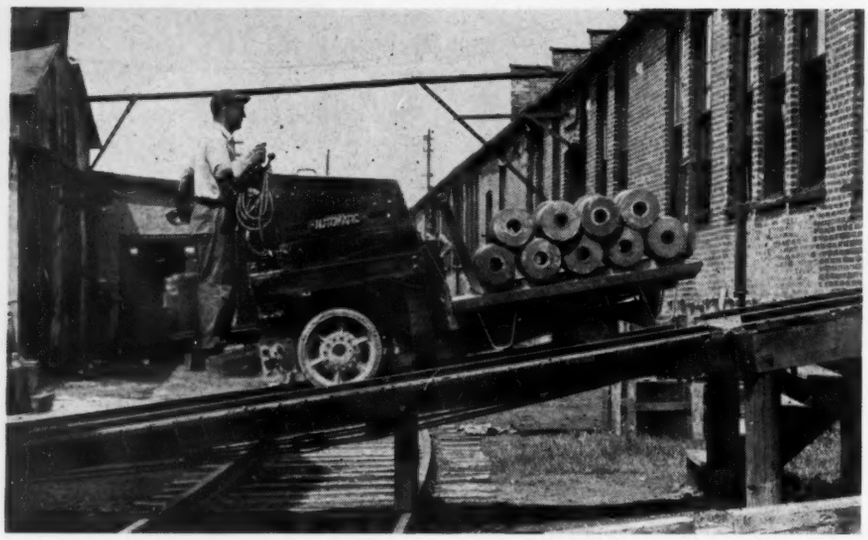
This change in method of handling materials involved the purchase of 45 skid platforms and an electric lift-platform truck of the 6000-pound capacity. The previous method had used cars on a narrow-gage track. Part of this system was retained, as will be explained later. The cars, however, are used both on the track and as skids for the truck on a short transfer. This change has resulted in not only more economical but speedier handling. It ties in so well with the part of the handling system not changed that no disruption of the work occurred in making the changeover.

Coils of 0.2075-inch rod are received in gondolas on a switch track cutting through the plant. Rod storage, pickling, cleaning and galvanizing are carried out in the building on one side of the track. Baking, drawing, annealing, redrawing and weaving into netting or wire cloth are performed in the building on the other side of the track. Drawbridges over the track connect the two buildings. The change in materials handling has affected almost altogether the operations in the second or production building where the larger proportion of handling is necessary.

Coils of rod, as received, are unloaded by a floor-operated electric traveling crane extending across the track and the loading platforms on each side. The coils are caught



Rolls of hardware cloth are handled on end from weaving to galvanizing or storage conveyor. Skids with removable standards and sideboards are utilized



Because of acid fumes the truck is not used in the pickling room. However, because of the incline connecting the buildings, wire is trucked to and from galvanizing department

on a hairpin hook and deposited on a car operating on the narrow-gage track, which carries the coils of rod to the pickling, cleaning and lime tanks.

Cross Drawbridge

The coils are then placed on another car and pushed across the drawbridge to the baking ovens. Up to this point the plant is still operating under the old system and was not changed because it was thought that the electric industrial truck might be affected by the acid fumes. Also, because of the straight flow of work through pickling, no confusion and interference result, as occurred in the production departments.

The narrow-gage car, loaded with about 6000 pounds of cleaned coils, is pushed into the baking oven on the track. After baking, the car is pushed out of the other side of the oven, still on the track, which is now sunk flush with the new concrete floor. Track beyond this point has been removed.

From the outlet of the baker the new lift-platform truck picks up the loaded car of baked rod and carries it to an electric hoist where the load is quickly transferred by a hairpin hook to a skid cradle platform. This is then taken to the wire drawing machines. The coils are transferred, because the cars are more expensive than skids, and the flanges on the wheels would cut the floor in the wire drawing room.

Under the old method of handling coils of rod, the cars, when cool enough to handle, were moved on the narrow-gage track to the machines. The cars and track also were used for the return of the wire after first and second drawings for annealing, for galvanizing of redrawn wire or product and all other handling.

This caused considerable confusion because of the difficulty in switching cars so that one could pass another, or to get an empty car or car of drawn wire past a car of coils of rod. The raised tracks also presented a tripping hazard and prevented any trucking.

When the lift-platform truck and skids were purchased about a year ago all narrow-gage track in the production building, except over one of the drawbridges and through the bakers, was taken out.

The 0.2075-inch rod is drawn to 0.069-inch wire in coils weighing about 300 pounds. These coils are lifted from the collapsible reels by a collapsible spider on a hoist mounted on a swinging jib which will handle work from four wire drawing machines. The coils are deposited on skid platforms, with end and side supports to retain the slippery coils, and taken to the annealing furnace.

Crane Removes Wire

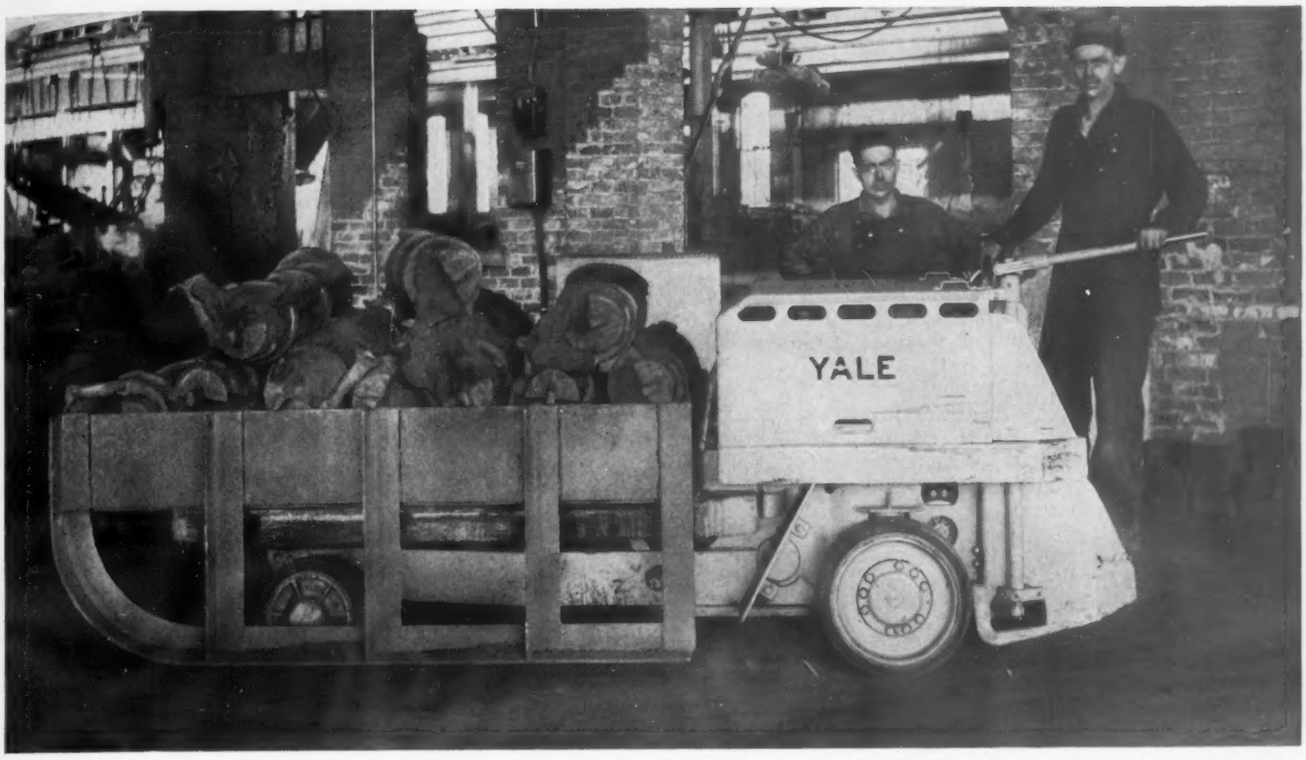
Drawn wire is annealed in pit-type furnaces. About 7000 pounds of wire are threaded over a stem by a hairpin hook on a floor-operated electric traveling crane and the loaded stem is deposited in and removed from the pit by the same crane. When the coils of drawn wire have cooled, the stem is tipped over by the crane. A hairpin hook is used to load the coils on a track car which is then taken by the industrial truck to the track at the building entrance. It is then pushed back across the drawbridge into the pickling room and returned on the car.

The car of annealed and cleaned wire is taken by truck to the hoist where it is transferred to a skid platform for handling to the redrawing machines and drawn down to various diameters, from 0.038 to 0.0248 inches. Heaviest demand is for wire 0.0348 inches in diameter. The ends of rod and coils of wire from first drawing are welded to-

(*Please turn to Page* 91)

Coils of rod pass through cleaning and baking operations on narrow-gage cars which are then used as skids by the truck. Photos courtesy Automatic Transportation Co., Chicago

For heavy-duty service with electric industrial trucks



Truck illustrated made by The Yale & Towne Manufacturing Co.

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Self-Fluxing Process Widens Field for Brazed Joints

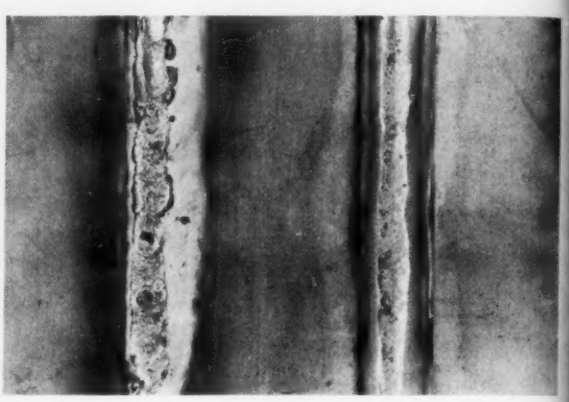
■ A NEW self-fluxing method for use in brazing has been developed by Automatic Gasflux Co., Cleveland. In the process, the gas used as fuel is impregnated with flux in vapor form.

The fluxer consists of two chambers, a storage chamber holding the liquid flux and a mixing chamber where the fuel gas is impregnated with liquid flux vapor by bubbling through this liquid. The liquid flux is a highly volatile composition that readily vaporizes to produce the required mixture of vaporized flux and fuel gas. One gallon of liquid flux impregnates 1000 cubic feet of fuel gas.

The process has several advantages which make it particularly suitable for brazing brass, steel, cast iron, galvanized iron, nickel, copper, monel and other alloys. Its main advantage is that it eliminates porosity in the joint, a trouble encountered in many brazing operations and one that has made the life of such joints an indeterminate factor.

In the usual method where flux in powder form is dusted over the area to be brazed, it is hard to control the amount of flux absorbed in the joint. Other methods of flux application have been attended by this same difficulty. The automatic gasflux system dispenses the flux through the brazing torch. A minimum amount very uniformly applied is the result. Also the flux impregnated fuel gas burns with a reducing flame which tends to prevent formation of oxides and to facilitate production of a tight joint.

A typical application where the process has proved valuable is on a joint where a copper tube entered a steel stamping. Previously brazed in the conventional manner and pressure tested, rejects amounted to about 15 per cent with frequent failures after about six months in use, accompanied by expensive service and replacement. A study of such defective parts invariably disclosed a tiny bubble which under continued heating and cooling had finally broken open and caused a leak. These glass bubbles appeared to be from the flux used although various types and kinds of flux had been tried with no improvement. When the automatic gasflux process was installed, brazing was easier, rejects were reduced, and failures in the field eliminated.



Joint at left brazed with rod dipped in dry flux. Joint at right brazed with automatic gasflux equipment. No cleaning was done on either joint

Porosity Eliminated

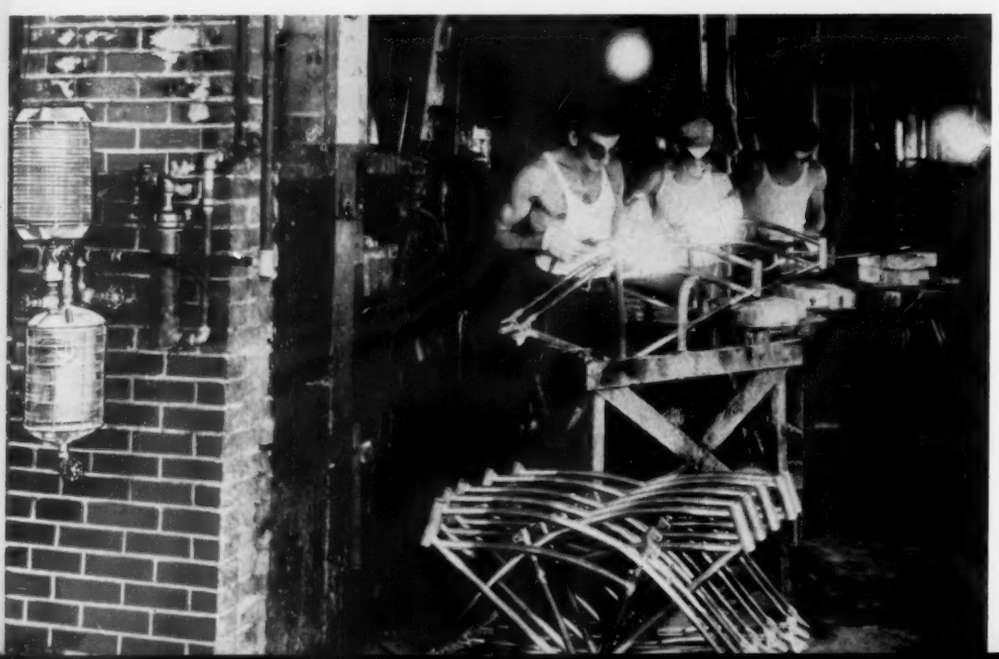
In another application where copper tubing was assembled in the manufacture of refrigerator units, troublesome porosity was eliminated by use of the automatic gasflux system.

Another important advantage of the process is reduction of fumes produced in brazing. In many instances the new system has completely eliminated fuming. In addition, the process brings considerable increase in speed with resulting higher production. Elimination of the pickling operation formerly required to remove enamel-like substances often found on and around the brazed joint is another feature.

Too, since tinning is speeded up, the entire operation can be accelerated so that less fuel gas is used, less brazing metal is required and less heat is put into the metal surrounding the joint. The process not only reduces cost per foot of joint but facilitates production of high strength joints between light and heavy sections and between dissimilar metals especially in thin sheets where the heat entering the metal becomes troublesome. This factor also makes the process suitable for other alloy work where low temperatures in the parent metal are particularly desirable.

The automatic gasflux system can be adapted to a wide variety of brazing operations using any standard gas. It does not require changing torches, tips or regulators and requires no special brazing technique for its successful use.

Tests made by an outside testing laboratory gave the following figures on fillet brazed joints in 0.038-inch sheet steel: Failure at 1355 pounds per lineal inch outside the joint, similar failure at 1370 pounds in a second test piece; butt joints tested 2020, 1610 and 1700 pounds per lineal inch of joint.



Gasflux equipment, at left, increased production, eliminated pickling, produced a better joint and decreased costs at the Shelby Cycle Co. plant, Shelby, O.

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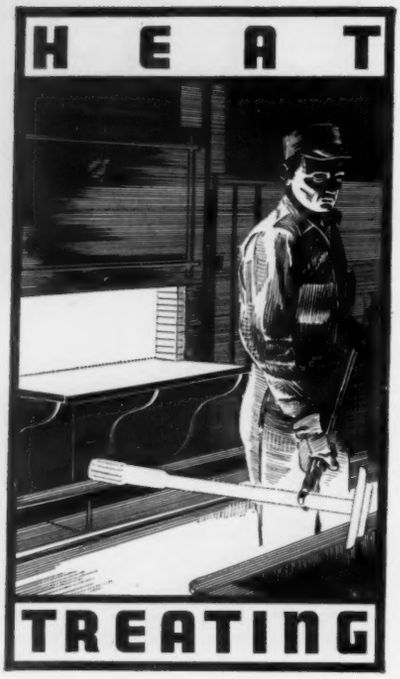


Nonferrous Annealing

Continuous, controlled atmosphere furnace equipment for bright annealing nonferrous materials now embodies several recent developments to give improved results

By W. F. ROSS
Furnace Engineer
Electric Furnace Co., Salem, Ohio

■ NECESSITY for producing bright, smoothly finished material of definite physical characteristics has led to universal acceptance of controlled atmosphere annealing furnace equipment throughout the nonferrous industry, particularly in connection with small gage copper, brass, bronze and nickel-silver wire and thin strip stock. Also there are many applications in which heavier materials, such as tubing, extruded shapes and straight or coiled bar stock are beneficially annealed in controlled atmosphere furnaces.

Material annealed in a controlled atmosphere shows good surface finish and smoothness and requires no pickling or cleaning. Another factor is elimination of scale detrimental to dies as well as the finished appearance of stock.

Practically all of the various alloys of copper with tin and zinc can be annealed without formation of scale. Heavy brasses and nickel-silver show, at high annealing temperatures, a characteristic deposit of metal sweat which is proportionately lessened with a decrease in treating atmosphere. In any case, it is easily removed in a flash pickle with no noticeable etching action.

The fact that work can be retained under heat for long periods of time without any scaling or oxidizing action allows complete freedom in regulating the physical characteristics of the finished product and makes possible the use of lower temperatures to produce physical characteristics ordinarily obtained at temperatures from 100 to 350 degrees Fahr. or higher. The increased time accompanying the use of these relatively low temperatures assures uniformity of anneal, also. Work annealed in special atmosphere furnaces can be held within limits of two points in hardness.

The controlled atmosphere is a combination of inert gases from which detrimental elements are either eliminated or held in combi-

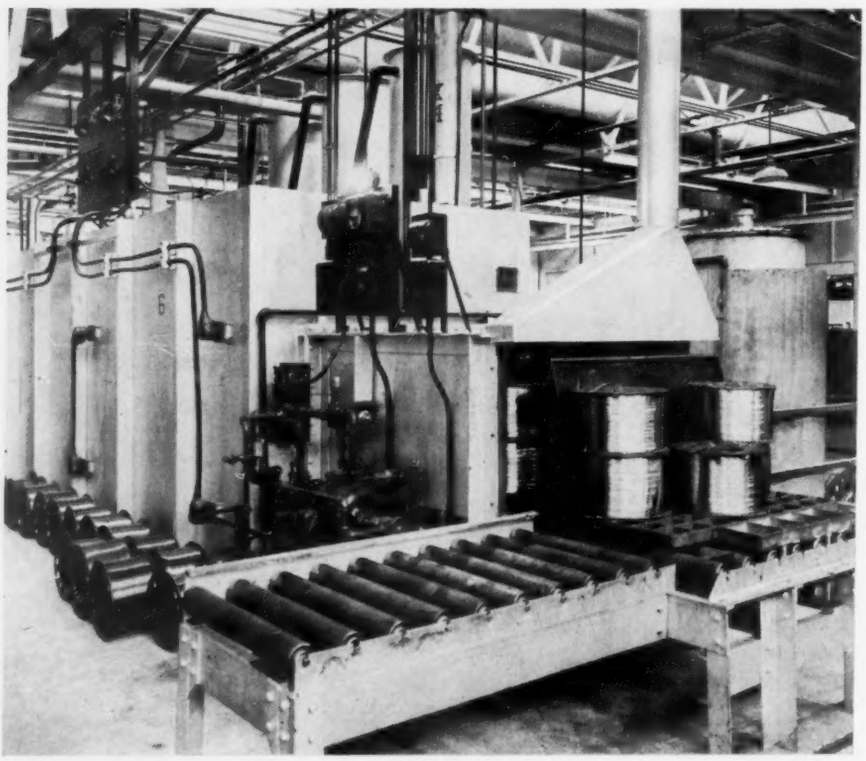
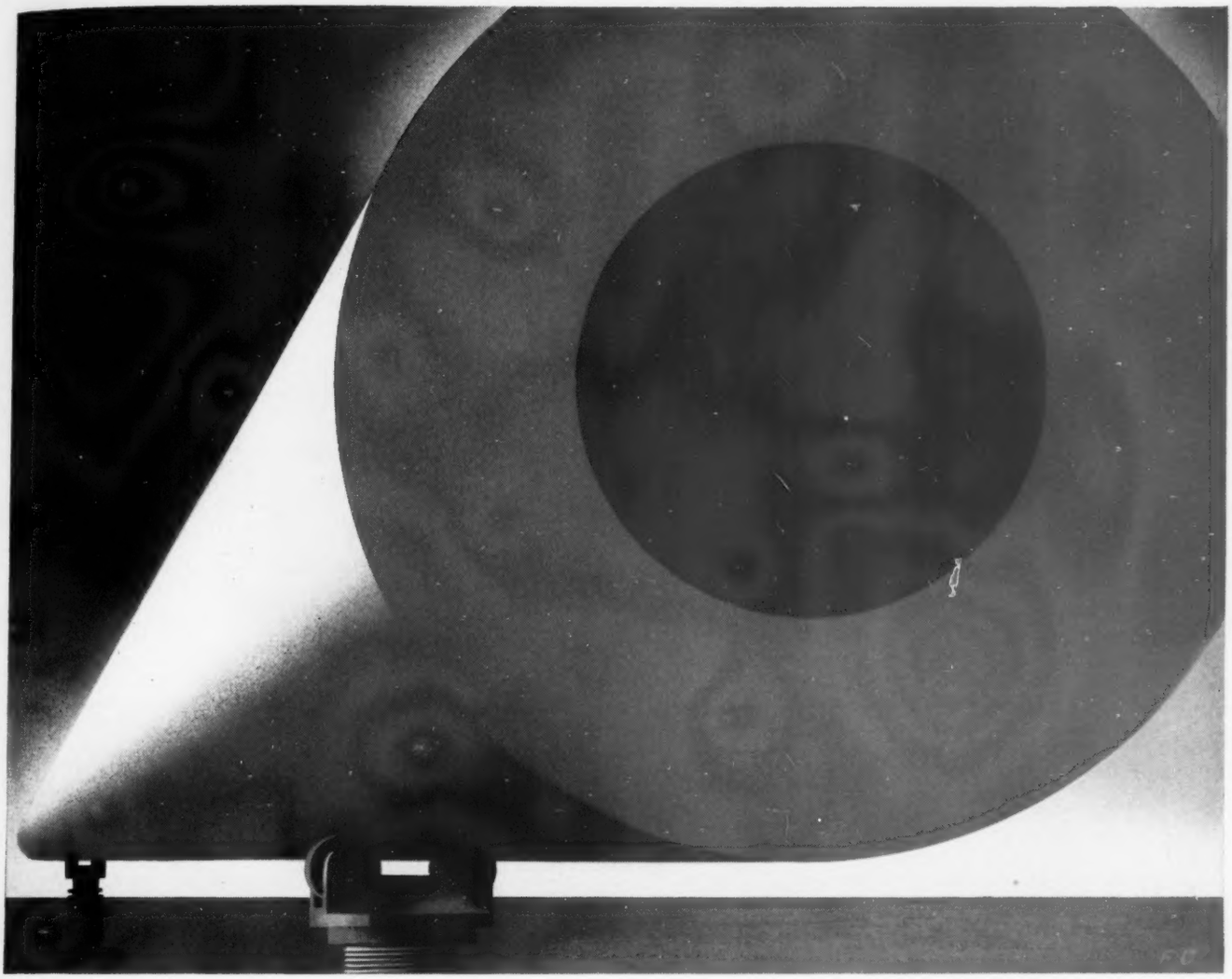


Fig. 1—Pusher type, 100 kilowatt furnace with special atmosphere bright anneals copper wire in a wide range of sizes



HUGE—YET UNIFORM IN PHYSICAL PROPERTIES

NECESSITY hastens many a discovery. When deep drilling in the oil industry created the need of extra-heavy, extra-durable drill collars, their service requirements and economical construction presented some new machine-shop problems. Among them was the finding of a steel which could be heat treated in long, massive chunks (sometimes 8 tons and 40 to 50 feet long) to produce uniform high physical properties and yet be readily machinable.

Chrome-Molybdenum (SAE 4140) steel proved the solution. It is widely chosen for this purpose because: (a) It develops the requisite physical properties. (b) It responds well to heat treatment—hardening uniformly through the large sections involved. (c) Its machinability at the relatively high hardness is excellent. (d) It is not susceptible to temper brittleness. And—with all its unusual fabricating and service qualities, it is comparatively inexpensive.

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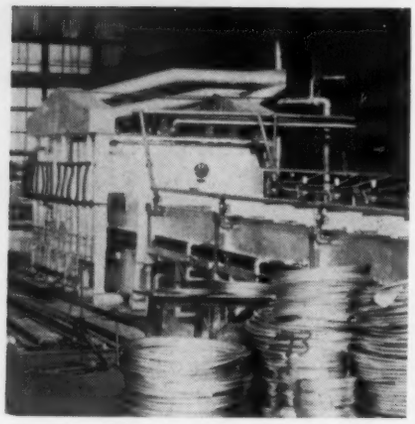

Fig. 2—Recuperative type, gas fired, radiant tube furnace used to bright anneal copper tubing in coils

nation in a harmless form. It may be made from dissociated ammonia in which nitrogen plays the part of the inert gas while the hydrogen is beneficial as a reducing agent.

Dehydrated Common

More common is the cleaned and dehydrated gas formed by the partial combustion of natural or manufactured gas. Percentages of CO or CO_2 are controlled within narrow limits to produce either an oxidizing or a reducing atmosphere. For use here combustible gas is not accessible. Atmosphere produced from the partial combustion of coal oil, coal, charcoal and other materials of high carbon and hydrogen content have been developed recently.

When sulphur is present in the fuel used for producing the atmosphere, it has to be removed since at high temperatures it produces a sulphide skin upon the material which is not easily removed by pickling. A simple method used to eliminate sulphur is to remove hydrogen sulphide and sulphur dioxide in scrubbing towers.

Since water vapor is susceptible to dissociation in the presence of carbon at high temperatures, it is necessary to remove the water formed in the atmosphere by the products of combustion. Also vapor might condense within the cooling hood and drop upon the work causing water spots or stains. Water vapor is removed in suitable traps and by rapidly cooling the atmosphere well below the condensation point before introducing it into the annealing equipment.

Any Furnace Adaptable

Any type of furnace in which a controlled atmosphere may be easily retained is adaptable to the production of clean work. Usual construction embodies a heating chamber contained in a gas tight, welded steel shell. Clean work can be produced in batch-type furnaces by bringing the material to the required temperature in an atmosphere purged of all air and then cooled under this same atmosphere within the furnace. In continuous furnaces, however, such as the roller-hearth type, roller-rail pusher type and others in which the work is steadily conveyed through the heating chamber in continuous production, it becomes necessary to add a cooling hood to the discharge end of the furnace to cool the moving work to a point below which oxidation will not occur upon discharge from the equipment. Controlled atmosphere is maintained in both heating and cooling chambers.

As the furnace must be sealed after purging and during the process of annealing several ingenious designs for minimizing the loss of the furnace atmosphere at the charging and discharging ends of the equipment have been developed, the type of work handled determining the design of any particular furnace.

The electric, cast-resistance-grid type of furnace is especially adaptable to the use of controlled atmosphere. The radiant tube type of furnace also is suitable since the products of combustion are confined within the radiant tubes themselves and do not come in contact with the work passing through the furnace.

A recent installation of this type is shown in Fig. 1. This is a continuous roller-hearth type furnace for bright annealing copper tubing in coils which are conveyed through the furnace on trays riding on continuously rotating rollers. Radiant tubes here are of the new gas-fired recuperative type developed by the Electric Furnace Co., Salem, O. In this design, otherwise wasted gases preheat incoming combustion air before it enters the furnace chamber thus requiring less fuel. As practically all the heat is utilized, products of combustion leave the furnace at very low temperature. Positive mixture of air and gas assures perfect combustion and makes it possible to maintain uniform temperature throughout the entire furnace chamber. Tubes are easy to adjust or to install and may be replaced while furnace is in operation.

Excellent Work Produced

Excellent work also has been produced in gas-fired furnaces in which the work passes through the heating chamber completely surrounded by a tunnel-type muffle of alloy or other non-permeable material. Where clean but not bright work is required, a gas fired furnace without the muffle is frequently employed with the products of combustion, from the burners themselves, forming a protective atmosphere. This type necessitates careful control of air and gas. Removal of sulphur and water vapor is not practical here and therefore its use is limited to installations for which sulphur free gas is available.

Fig. 2 illustrates a gas-fired, continuous furnace of this type for clean annealing both large and small coils of brass wire. Coils are conveyed directly on traveling heat-resisting alloy chains.

Charging end of a roller-rail furnace is shown in Fig. 3. This equipment consists of an electrically-heated chamber and a long water-jacketed cooling hood with baffle-type vestibules at the charge and discharge end. As loaded trays enter the furnace, they continuously contact baffles within the vestibule, thus minimizing exfiltration of the atmosphere. Since there are at all times three or more trays in progress through the vestibule, the charging entrance of the furnace chamber is adequately sealed and such atmosphere as does pass from the furnace chamber around the baffles, provides an excellent purge for what air might otherwise pass into the furnace with the work.

The conveying system consists of

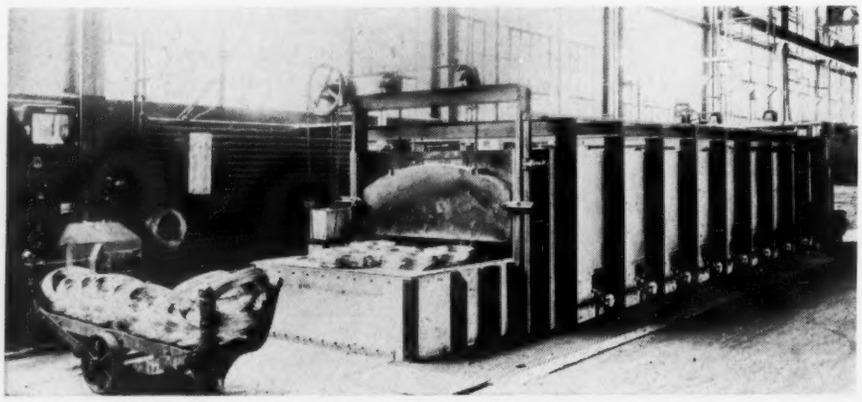

Fig. 3—This gas-fired furnace anneals 5000 pounds of brass and bronze wire per hour. Material travels continuously on heat-resisting alloy chain conveyors

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two roller rails extending the length of the heating and cooling chambers. Trays of material pass in a continuous line over these rails to the discharge end of the equipment where the trays run out upon a roller-top table from which the work is easily removed.

Results Produced

This equipment has produced excellent results in the annealing of bronze and phosphor-bronze wire in coils. Soft annealed brass and nickel-silver also are produced in a clean scale-free state. Furnace is used over a temperature range of 700 to 1500 degrees Fahr. and is rated 135 kilowatts. Protective atmosphere is produced in a generator consisting of a combustion chamber, pumping equipment, cooling coils and the necessary air-gas ratio metering equipment. Prior to introduction to the furnace, the atmosphere is led successively through a water trap, three scrubbing towers for desulphurization and a refrigerator for removing any remaining moisture from the atmosphere. The complete furnace with heating chamber, cooling chamber, gas generator, refrigerating units, scrubbing towers, etc., is shown in Fig. 4.

Fig. 5 shows a similar installation for annealing coils of extremely fine nonferrous wire wound on steel spools. This furnace is rated 100 kilowatts for use at annealing temperatures between 700 and 1000 degrees Fahr.

Only one of the possible sealing systems has been mentioned. There are, of course, other methods of minimizing atmosphere loss. Although cooling hoods adjacent to the furnace chambers are usually of the water-jacketed type, banks or sections of water-cooled coils through which cold water is continuously forced are sometimes used. Where a compact arrangement is desired, successful cooling has been accomplished by a centrifugal fan recirculation system withdrawing atmosphere from the cooling hood, through a heat exchanger and returning the cooled atmosphere to the hood. This method of cooling is particularly adaptable to large equipments.

Fig. 4—Charging end of continuous, roller hearth, controlled atmosphere, electric furnace bright annealing bronze and copper wire loaded on trays which are pushed through the furnace

Fig. 5—Complete view of same furnace shown in Fig. 3 with gas generator, refrigerating unit, desulphurizing towers, etc. Coiled strip is handled also

♦

A.S.T.M. Issues New Index Listing All Standards

■ American Society for Testing Materials has published its annual index listing and giving information on its 823 standards and tentative standards as of Jan. 1. This index is of service to anyone wishing to ascertain whether the society has issued standard specifications, test methods, or definitions covering a particular engineering material or subject and it is of help in locating the standards in the volume where they appear.

All items are listed in the index under appropriate key words according to the particular subjects they cover. As a convenience, a list is given of the specifications and tests in numeric sequence of their serial designations. Copies of the publication may be obtained without charge by written request to society headquarters, 260 South Broad street, Philadelphia.

New Coating Prevents Weld Spatter Adhering

■ A new coating has been developed by Wayne Chemical Products Co., 9502 Copeland, Detroit. It is furnished in the form of a very light jell that may be applied by brushing, dipping or spraying. It contains water and is said instantly to cool the hot welding sparks as they strike the surface thus preventing them from becoming attached. Parts subsequently are cleaned easily with hot water or cleaning solution.

This coating eliminates the labor of chiseling, filing, scraping to clean off welding spatter from parts adjacent to welds. Its use also lessens the chance of hard metal particles damaging gears and moving parts in axle and other machinery housings.

Cream Protects Skin

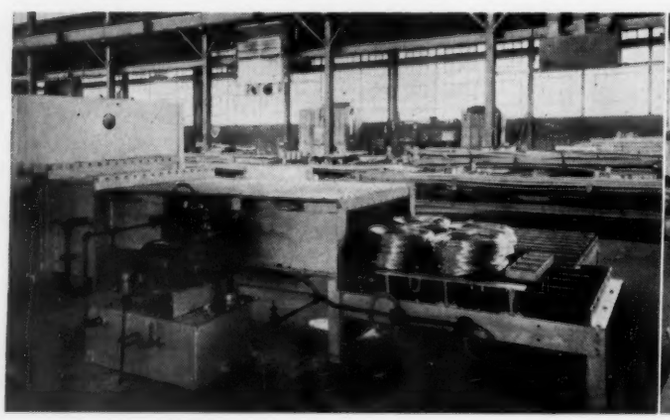
■ A new type of protective treatment for the hands of industrial workers has been placed on the market by Davis Emergency Equipment Co., 55 Vandam street, New York.

The treatment consists of two different creams. The first is rubbed into the face and hands before starting to work, giving the worker protection against the action of chemicals, solvents, grease and other harmful substances to the skin. It is easily washed off without the use of any abrasive soap.

After finishing the days work and the former grease is washed off, the second cream is applied, replacing the natural oils of the skin and leaving it in a soft natural condition.

Not Electronic Tornado

■ In the article, "Shielded-Arc Automatic Welding Is Developed," which appeared on page 54 in STEEL of Feb. 14, it was not made sufficiently clear that the new automatic shielded-arc welder developed by Una Welding Inc., Cleveland, operates with a metallic arc. This new welder is not to be confused with the automatic, shielded, carbon arc welder known as the Electronic Tornado system. The latter system was developed nearly 10 years ago by Lincoln Electric Co., Cleveland, and has been used extensively in fabricating pipe, tanks, boilers, automotive parts and many other products.



Modernistic Building Uses Glass And Welded Steel

■ To give additional space for the prefabrication of arc welded steel houses, Hobart Brothers Co., Troy, O., has recently completed a modern arc welded steel building unique in many ways.

General design consists of a large center bay 40 feet wide by 25 feet high, flanked on each side by lower sections 20 feet wide and 12 feet high. At no point is there a bolt or rivet as the entire building is made integral by arc welding. Two-thirds of all vertical surfaces are clear glass or glass brick, insuring best daylight conditions.

Welded steel panels, consisting of two sheets of steel spread apart by a steel strut and packed with insulation provide the thermal equivalent of a 30-inch brick wall. These panels are assembled into frames by arc welding. Insulated side panels are 4 inches thick. Roof panels are 8 inches thick. This insures minimum heating cost in winter and maximum comfort to workers in summer. Insulation of houses is an accepted improvement which Hobart Brothers felt to be just as desirable in factory buildings.

All parts were fabricated from formed steel in the company's steel-house shop. All trusses, panels, windows and small parts were welded into subassemblies and passed on to erection crews who welded them into their final positions. This is similar to the system employed in assembling the houses themselves.

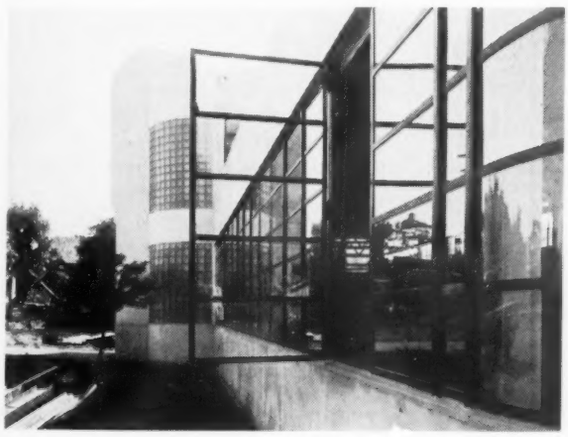
Arc welded steel factory in which prefabricated welded steel houses are built by Hobart Brothers at Troy, O.

Type of window developed is new in many respects. Each window is 3 x 7 feet and has five horizontal glasses. Each window was made to abutt the adjacent window without mullions between, giving the effect of continuous glass sections all around the building. Corners were made round with continuous curved glass to give a pleasing and modernistic effect. One-third of the windows are hinged on the side and are controlled by an opening and closing device which sets them at any desired point.

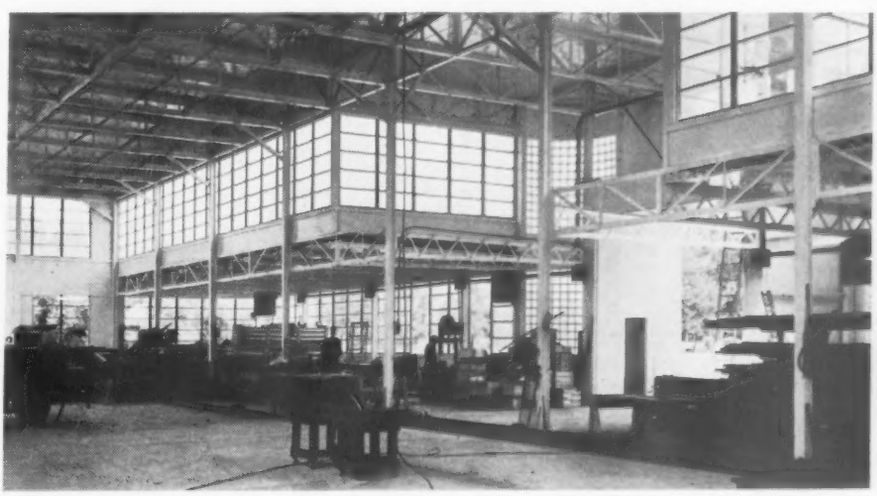
Specifications required overhead traveling hoists to lift heavy sections of steel houses in the central portion of the building. To obtain the required strength, conventional trusses were used overhead, continuously welded at all joints to obtain maximum strength.

Interior of building was finished in glass white enamel. This coupled with maximum light entrance from a large window area results in good natural lighting.

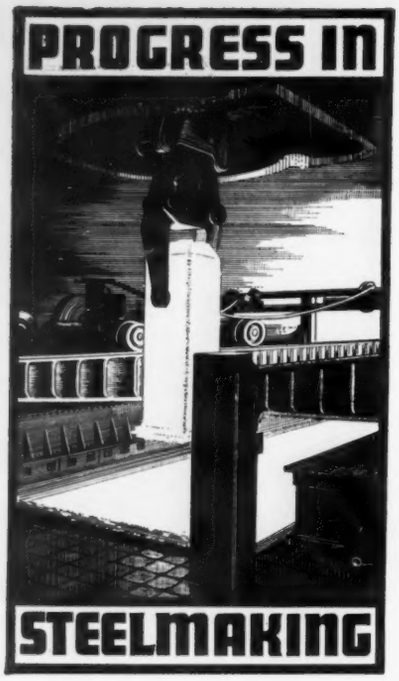
Treatment of the exterior is modernistic. Finish is snow white with seafoam green window trim. All corners are round, and all pylons and other trim are curved to give an unusual and pleasing effect. At one end of the building are conventional type doors for entrance of raw material. At the other end are airplane-hangar type doors to permit the removal of a completed house.



So-called "air scoop" windows which can be set to direct air through building. Alternate windows are hinged on opposite sides to pick up air from most any direction



Showing large amount of light from natural sources which reaches interior of the building due to the wide glass areas and white enameling of interior surfaces which gives a high reflection factor



Lean Ores

New stack now under construction in Scunthorpe district, England, will smelt lowest grade iron ore used commercially in large quantities in any place in the world

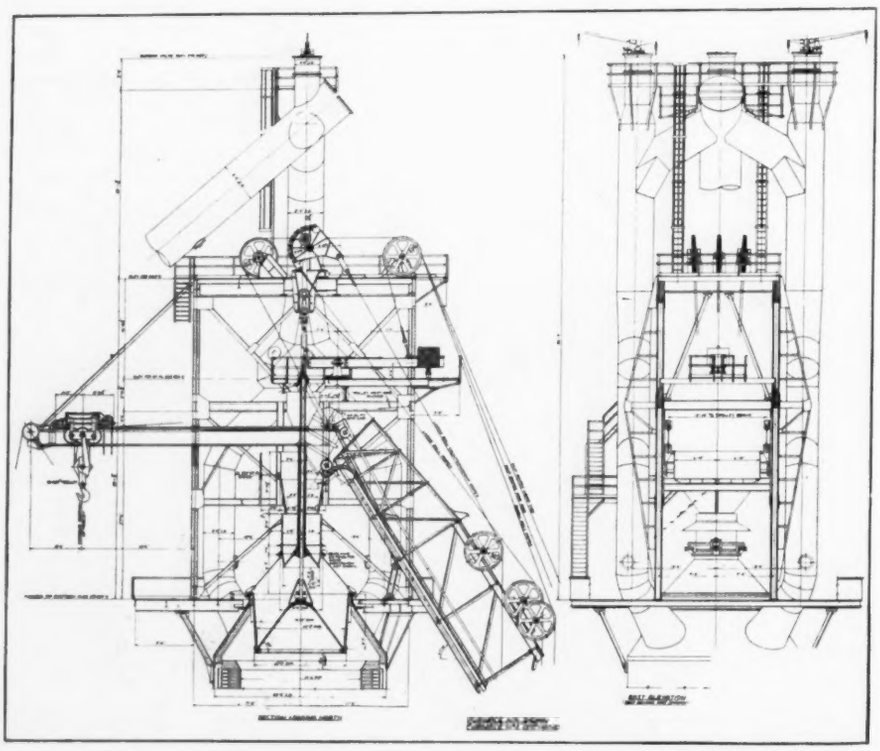
PART II

By **WM. A. HAVEN**
Vice President
Arthur G. McKee & Co.
Cleveland

■ OTHER NOTEWORTHY points in which the usual English design varies considerably from American layouts are the furnace cooling systems, stockhouse and top charging systems, and transport for raw materials, slag and hot metal.

All the Appleby-Frodingham furnaces have used low-pressure spray-cooling systems, including a novel suction method for tuyere cooling. Top charging has been mostly by drop-bottom buckets, although Frodingham claims one revolving distributor of its own design that dates from 1906. Stockhouse bins and transfer car systems are similar in principle, but not close in actual design to American types. Practically all of these features on the new furnaces, however, will follow modern American practice although a low-pressure spray system for watering the inwall cooling plates is an exception. The open-ended, cigar-shaped cast-iron plates that have been developed at Frodingham are economical to make, easily replaced, and have successfully maintained the lines on the old stacks. It is claimed that leaking plates of this type are not so damaging to the furnaces, and are more easily detected.

Fig. 12—Arrangement of furnace top



Most British rolling stock is small compared with the American type, 20 tons being about the maximum capacity of ore and coal wagons and the new plant had to be adapted to the standard conditions in this respect. However, for handling materials within the plant, transfer cars, overhead cranes, belt conveyors and other conveying equipment of capacity and designs equivalent to modern American practice have been applied. The chain operated Dewhurst slag ladle that has always been popular in England will be supplanted with 400 cubic-foot self-dumping units of Pollock design. Hot metal ladles will be duplicates of 60-ton mixer type units now in service. A new double strand Johnston-type pig casting machine is being built to handle iron from the old furnaces as well as from the new ones.

As a description of many features of the new plant, it will be sufficient to point out that they will be of customary McKee design and will include the stocking and charging system, complete with ore and coke transfer cars; scale cars, weigh hoppers; revolving tops, baffled offtakes, single downcomers, dustcatchers, centrifugals, tower scrubbers and gas valves of several types, and

nested-tile hot blast stoves with 1⅛ x 1⅛ x 1¼-inch checkers and metal bottoms. The 101½ x 22½-foot stoves will be of all-welded construction, the Appleby-Frodingham Co. having distinction in 1936 of building what is said to be the first all-welded stove. Steel work for the stoves, blowing engine room, blast furnace trestle, and other important parts of the plant are being fabricated in their own structural shop, and erected by their own field crews.

The most important problems, however, and it might be said, the most interesting ones in connection with this project, have been the design of the stacks and of the ore preparation plant.

The development of lines for the present stacks, as shown in Fig. 13, has resulted in furnaces which ordinarily move regularly, at low pressure and with only a small production of flue dust.

To get the required additional output of 5000 tons per week, two stacks not much larger than the present Appleby No. 6, which is only

Table IV
Principal Dimensions of New Appleby-Frodingham Stacks

Hearth diameter	22′—0″
Bosh diameter	27′—0″
Top diameter	19′—6″
Bell diameter	15′—0″
Bosh angle	78°—11′—30″
Batter	1″ per foot
Height of:	
Hearth	9′—6″
Bosh	11′—0″
Straight section	11′—1″
Batter section	44′—11″
Top straight section	6′—7″
Total height from notch to top platform	94′—4″
Number of tuyeres	14
Number of tuyeres	7
Number of columns	7

17 feet in the hearth, would have sufficed; for the design of furnaces any larger than this, there was little precedent to be found. There are a few furnaces in England with a hearth diameter as large as 20 feet operating on similar ores, but so far as could be learned, their operation is not nearly so smooth as that of the Scunthorpe units.

However, it is the writer's opinion that if other conditions were right, a furnace should function just as advantageously on ores of 25 per cent iron content as on ores of 50 per cent iron content; the furnace size was established on the basis that this theorem is correct. For the present the furnace hearth will be lined-in to 22 feet, which will give what is believed to be the largest hearth in Great Britain; on subsequent linings this dimension can readily be increased to 24 feet if desired.

As shown in Fig. 15 the lines of

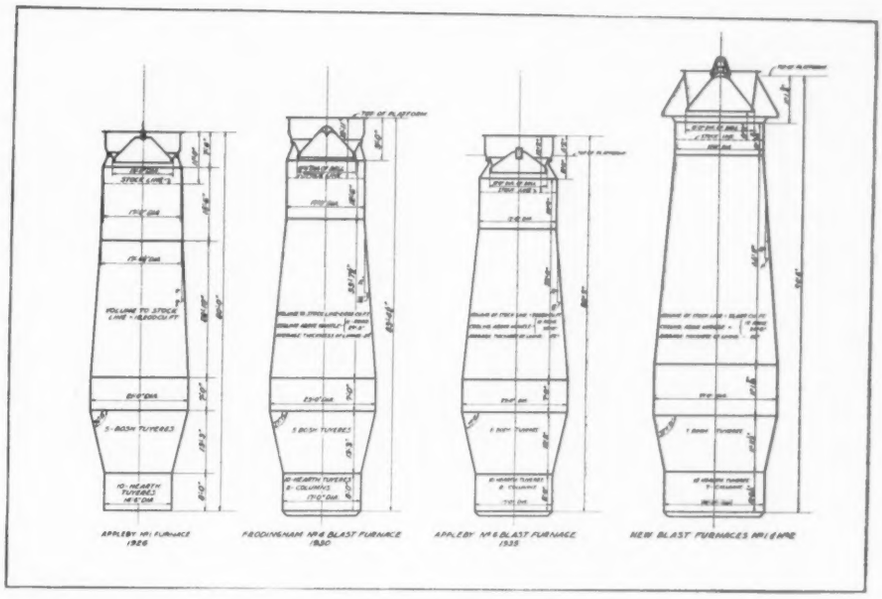


Fig. 13—Comparison of lines of old and new Appleby-Frodingham furnaces

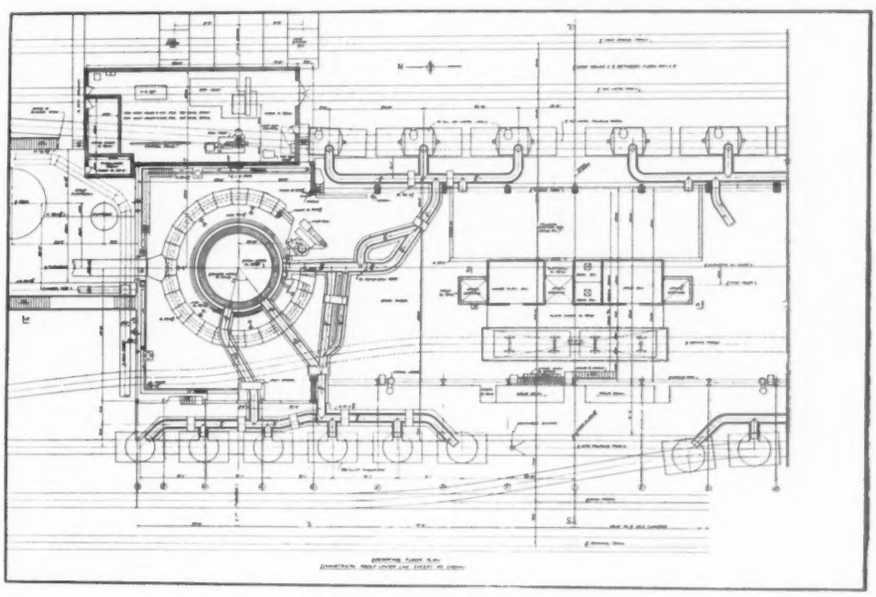


Fig. 14—Plan of cast house for new furnace

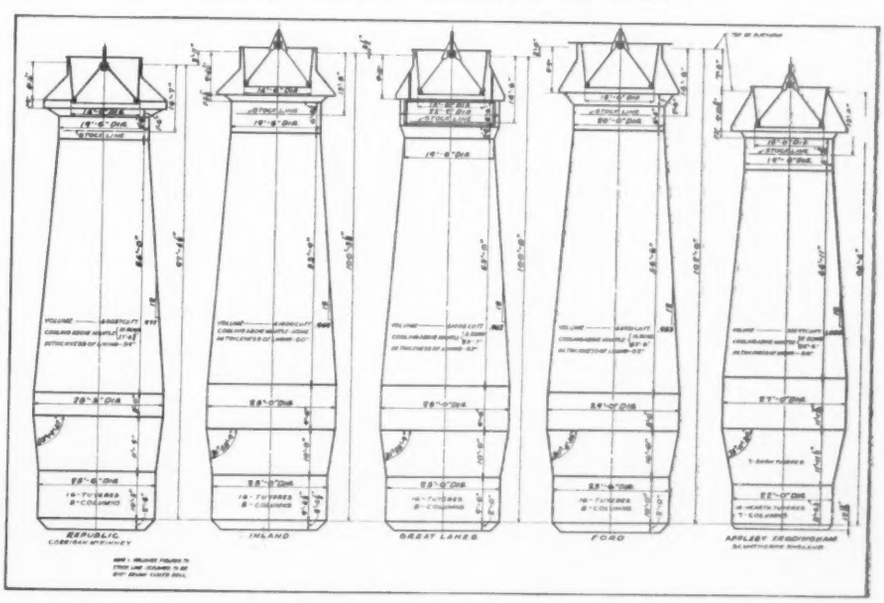


Fig. 15—Lines of new stack compared with 1000-ton American furnaces

the new stacks for the most part have been proportioned in a manner similar to our modern American stacks, the principal exception being in the height and angle of the furnace bosh. Here again a compromise was dictated by the fact that a smooth operation had been obtained on the old stacks with a comparatively flat, high bosh. Lines of the new stacks compared with those of the old Appfrod units, and those of some furnaces recently designed by the McKee company for some well-known American producers are shown in Fig. 13 and 15.

Provisions have been made on the new stacks for use of bosh tuyeres, although they will not be initially installed. This now almost extinct specie of furnace fixture is still highly regarded at Scunthorpe, and has survived many other attempts to get along without it despite the fact it clutters up the bosh. It is to be hoped this one will be successful. Regular tuyeres totaling 14, are spaced between seven columns.

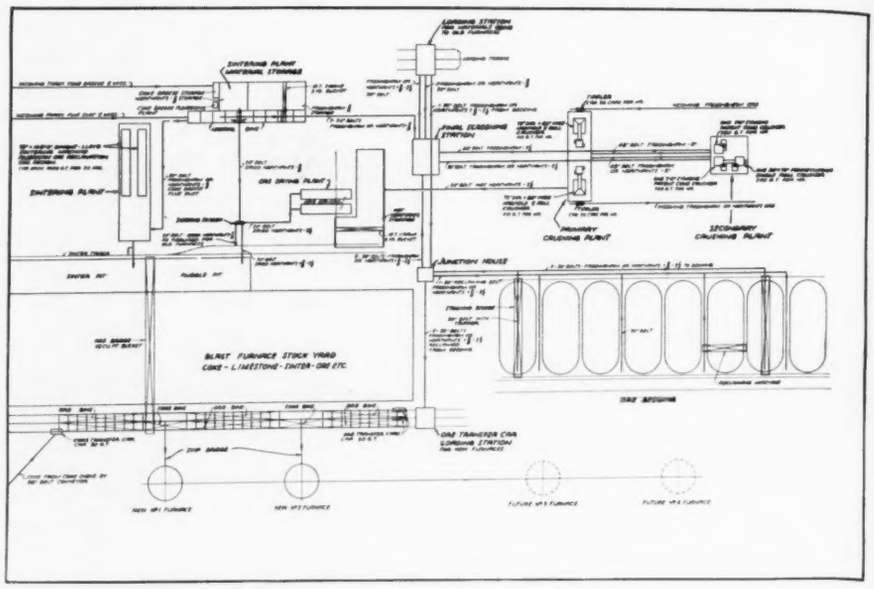


Fig. 17—Arrangement of plant for preparing and handling ironstone

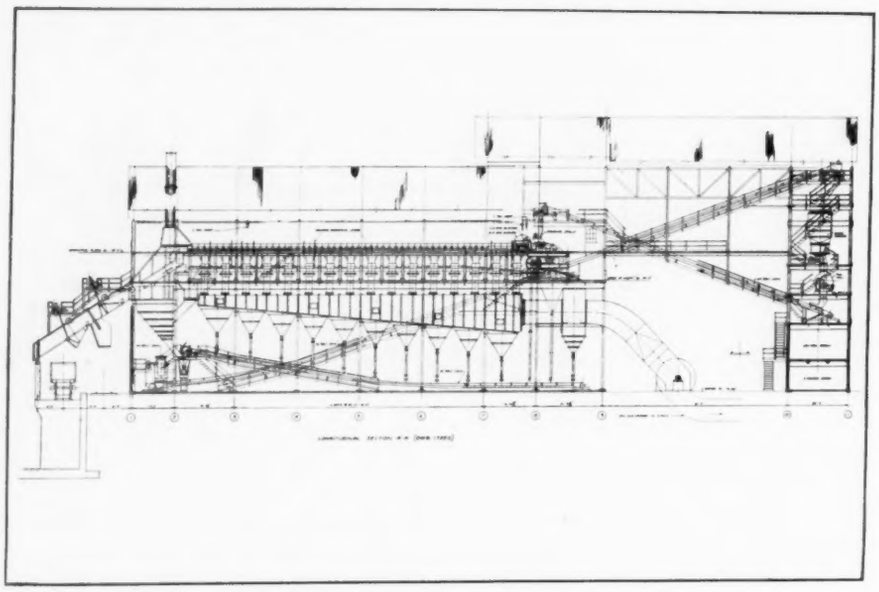


Fig. 16—Longitudinal section through sintering plant

Equal in importance to increasing the size of the furnaces have been the measures taken for the beneficiation of materials. Included in these are the new coke ovens with a proper sizing and screening station and a belt-delivery system to the blast furnace trestle. Unusually complete facilities are being provided to crush and screen the ore, to sinter the fines and to eliminate the troublesome wide fluctuation in chemical analysis that characterizes the local ironstones.

The ores used at Scunthorpe, are described by a British authority as follows:

"The Frodingham ironstone is a ferruginous fossiliferous limestone with distinct oolitic structure. The iron is present as hydrated oxide, but this only applies to the surface rock now being quarried under a greater cover it will certainly be found as carbonate. Indeed this is the case with the lowest beds worked in the quarries.

"The average natural chemical analysis of the ores of the district is computed as follows:

Element	Per cent
Iron	22.66
Manganese	0.096
Silica	8.10
Alumina	5.07
Calcium	18.15
Magnesium oxide	1.00
Sulphur	0.16
Phosphorus	0.31
Combined water, carbon, dioxide and oxygen	32.86

"A small proportion of the upper layers is siliceous. Immediately below the siliceous layers is a seam of dark colored shale, carrying pyrite. Below the shale band the iron-

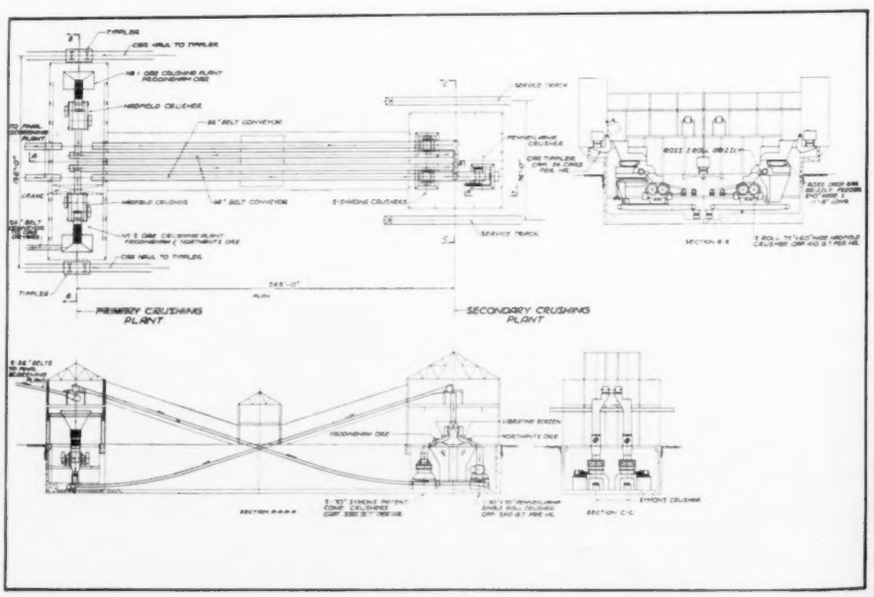


Fig. 18—Longitudinal section of primary and secondary crushing plants

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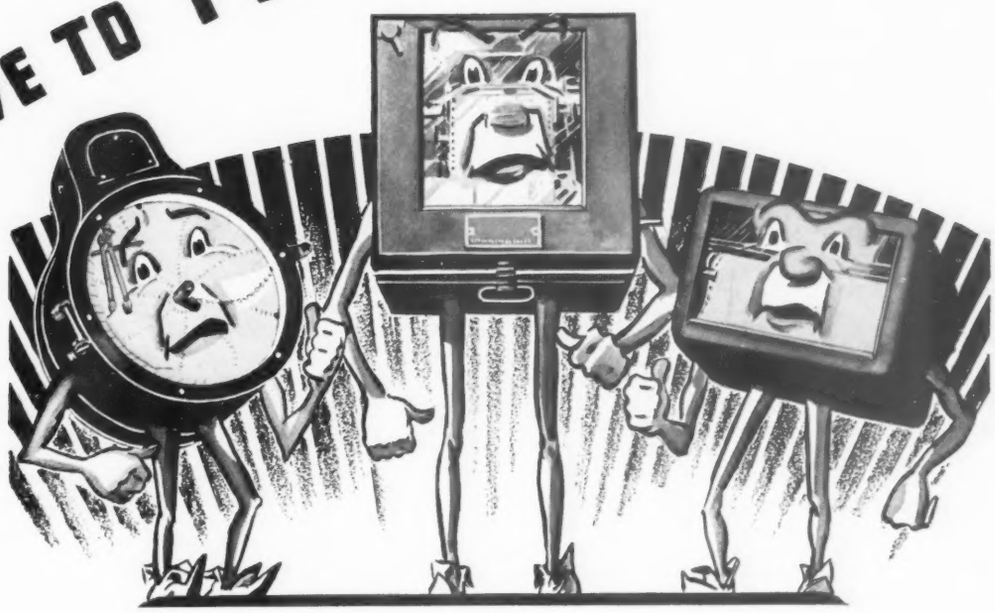

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Westinghouse MAZDA LAMPS

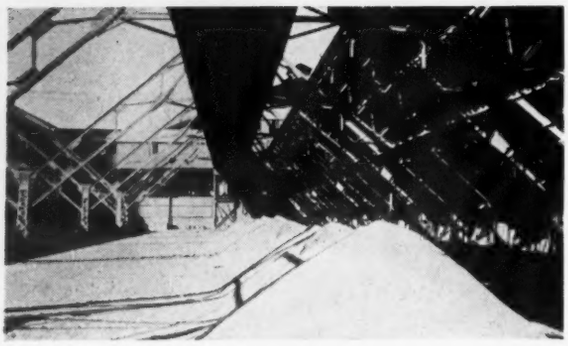

Fig. 19—New bed being formed

stone is limey and consists of dark brown bands, rich in iron, alternating with narrow bands of a light colored hard shelfy limestone, of which the iron content probably does not exceed 12 per cent."

The ironstone is blasted from the quarries in pieces of steam shovel size, but being much softer than ordinary limestone, is prone to pulverize. Crushing of the lumps consequently is attended with considerable production of fines, to which must be added large amounts of fine ore produced by weathering and during the mining operations.

Until not many years ago the great bulk of these ores were charged into the furnaces in as large pieces as could be loaded by man power into a barrow. The Appleby-Frodingham company, which has pioneered in beneficiation, has several primary crushers in operation, and what is believed to be the largest sintering plant in England. The value of crushing has been thoroughly demonstrated, but neither at this plant nor at other plants in England have completely adequate means for crushing, screening and sintering been provided. The farthest to which crushing of these ironstones has yet been carried as routine practice seems to be about 5 or 6 inches.

In the new plant both primary and secondary crushers of ample capacity are being installed so that the particle size of the materials will be completely under control. It is proposed to crush initially to 2½ inches maximum, which would seem to be sufficiently revolutionary for a beginning, but if it should be found advantageous, the secondary crushers can be set up to 1½ inches maximum opening. All minus ⅝-inch material will be removed from both grades of ore and sintered.

The Frodingham ores, like the Minettes of Alsace Lorain, are undoubtedly easily reduced, and crushing is probably not nearly so vital, from this standpoint, as it is for magnetites or hard hematites. But the procedure should find ample justification, if only in the improvement that it will effect the distribution of materials in the furnace.

Preparation of the Northants ore is further complicated by the fact that the siliceous weathered Northants fines become extremely sticky even in moderately wet weather, so that secondary crushing and screening out the minus ⅝-inch fines for sintering present an unusually difficult problem.

In the treatment of Northants ore, therefore, the undersized material from the scalping screens in advance of the primary crushers, at minus 4 inches or as much less as the varying conditions will permit, will be conveyed separately to a rotary kiln and dried. After reduction of moisture content to about 10 per cent, the minus ⅝-inch material will be screened out and delivered to the sintering plant bins; and, the coarser material, or rubble, direct to the furnaces. A section through the sintering plant is shown in Fig. 16.

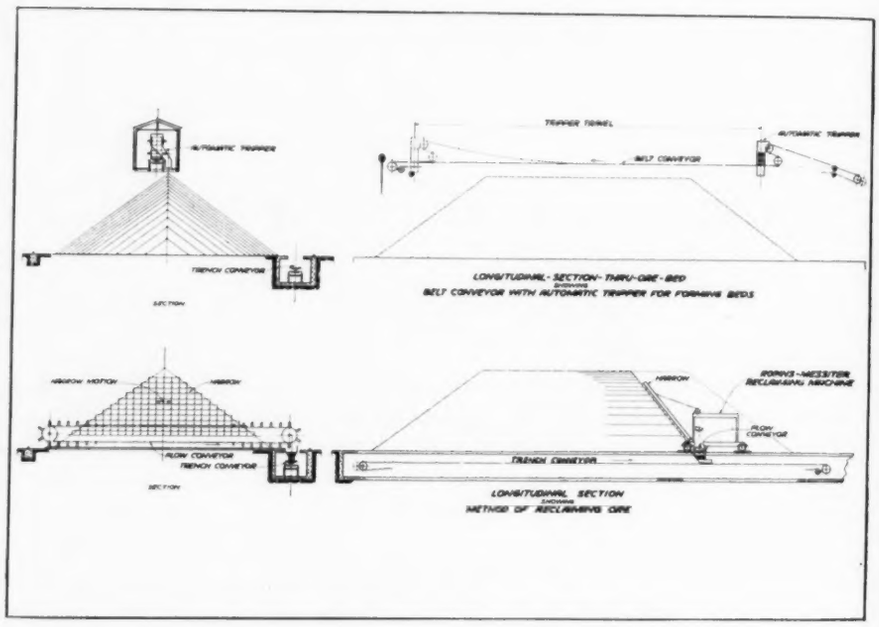

Fig. 21—Diagrammatic view of Robins-Messiter bedding system

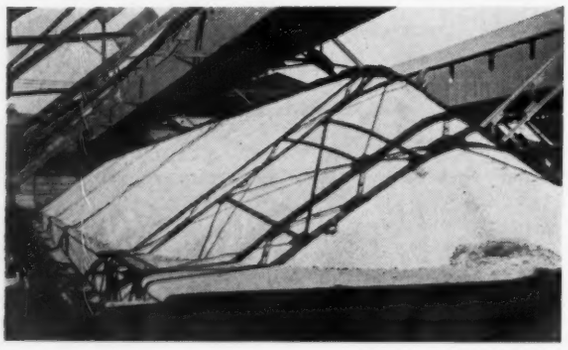

Fig. 20—New bed formed and ready for reclamation

The ore that will be required at the new furnaces will comprise only about one-third of the total materials to be handled ultimately at the new beneficiation plant. The installation of tipples, crushers, screens, conveyors, driers and sintering equipment that is now being installed will be of sufficient capacity to prepare also a large part of the burden for the present Appleby-Frodingham furnace plants and for two additional furnaces that may eventually be added to the present new plant. The total normal capacity of this new material handling station is rated at 45,000 tons of

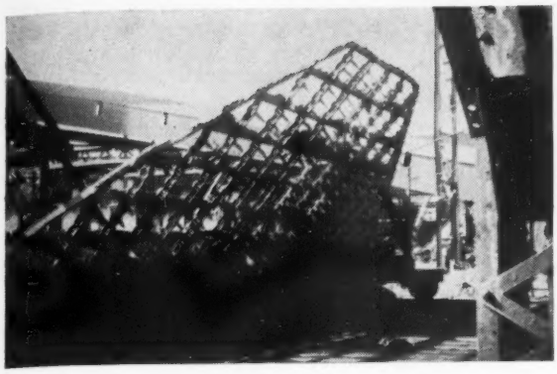

Fig. 22—Reclaimer harrow

Frodingham and 15,000 tons of Northants ore when working eleven 8-hour turns per week, or five and one-half days at two 8-hour turns per day. The new sintering plant, of two strands, the first American Ore Reclamation type machines to be built in Europe, will produce from 2000 to 3000 tons daily.

Worthy of especial mention, however, may be the system that is being installed for the purpose of controlling chemical analysis of the burden. In addition to the usual stock house bin system and a conventionaly raw materials storage yard, it is planned to use also a novel system of stocking and reclaiming ore, known as the Robins Messiter bedding system. The crushed materials as they come from the final screening station are spread in thin layers by a belt system into beds 59 x 150 feet in area, and to a depth of about 22 feet; capacity of each bed will be about 3500 tons. Reclaiming is done by slicing sections from this triangular-shaped bed. The system has been borrowed from the copper industry where it has been in use for some years, and is said to have reduced fluctuations to about ½ of 1 per cent.

Advantages of such a system for grading the Frodingham ironstone will be readily apparent. In a depth of 27 feet the analyses of a typical face will vary in lime content from 1 to 30 per cent and in insolubles from 34 to 3.5 per cent. Wide fluctuations likewise occur within short distances horizontally along the seams.

Willingness to be first in the industry to try out this novel system of ore grading indicates what the policy of the Appleby-Frodingham Co. has been with regard to this plant as a whole. Practically every promising modern improvement of British, American, or other origin has been considered. None of importance has been omitted that has had the joint approval of the operating officials and consulting engineers as a justifiable means for improving the quality or decreasing the cost of pig iron, or indirectly, of steel.

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Porcelain Enameling Manual Is Issued

■ *A Manual of Porcelain Enameling,* edited by J. E. Hansen and associates at the Ferro Enamel Corp., Cleveland; fabrikoid, 514 pages, 6¼ x 9¼ inches; published by the Enamelist Publishing Co., Cleveland; supplied by STEEL, Cleveland, for $5; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster S.W.1, London.

This volume brings the technique of porcelain enameling in all its phases up to date by including the industry's latest approved practices and engineering accomplishments. It aims to fill the need for a comprehensive work on the theory as well as practice involved in modern porcelain enameling. It is not all theory, however, as it is written by practical men, each a specialist in his own field.

The book is a revision of "The Advanced Technique of Porcelain Enameling" which in 1932 succeeded the original work, "The Technique of Porcelain Enameling," published in 1927. The new book includes knowledge obtained from many years' experience in porcelain enameling plants all over the world.

It covers design and fabrication of sheet iron and steel parts for porcelain enameling, preparation of metal surfaces, enamel room practice, mill additions, water and air supplies for enameling plants and enamel shop construction, equipment and layout. Individual chapters are devoted to application of enamel, drying, brushing, burning, inspection and process control.

One chapter, which deals with cast iron for enameling purposes, is a discussion of foundry practice for castings which are to be enameled. Several sections cover enameling of signs, hollow ware and decorations. Shop troubles and their cure are given considerable space. Chapters on enamel furnaces and refractories, and muffle furnace atmosphere and temperature gradient effects contain much information.

In addition, a 30-page enamelers' dictionary and a number of tables are included. Being a complete departure from earlier editions, the new book deals with many entirely new subjects and up-to-the-minute production processes.

Practical Course for Sheet Metal Worker

■ *Sheet Metal Work,* by William Neubecker; cloth 353 pages, 5½ x 8¼ inches; published by American Technical Society, Chicago; supplied by STEEL, Cleveland, for $2.50; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

This is a manual of practical self instruction in the art of pattern drafting and construction work in light and heavy-gage metal, including skylights, roofing, cornice work, patterns for forced air fittings and a wide variety of other work.

The author's aim is to provide the sheet metal draftsman a deeper understanding of geometrical principles, the areas of surfaces and other matters necessary to the development of complex surfaces so that the sheet metal form made from his drawings can be put together without waste or distortion of the form intended.

The studies pointed out for the student are typical and details are handled so they will be as readily understood by the beginner as by the experienced craftsman.

Fig. 23—Group of members of committee in charge of plant construction

From left to right, back row: Messrs. Baxter, Crooke, Howat, Kemp, Turner, Moses, Nisbet, Atha. Front row: Haven, Barren, Behrendt. Members of committee not shown are Messrs. Walsh, Sharpe and Johnson.

Labyrinths OF STEEL RESEARCH

Like this maze of tubes for delicate determinations of gases, Armco research is rarely a straight path to a visioned goal. Days often flow into weeks and even months before a new method or a new product is ready for the practical applications of industry. Out of Armco Research Laboratories have come many original and useful metals: ARMCO Ingot Iron, electrical sheet steel, enameling iron, and more recently H.T.-50, PAINTGRIP and ZINCGRIP sheets. This long experience, this painstaking research, could well be an ally to you in your quest for cost-reduction and product improvement. ☛ We invite you to submit your problem. The American Rolling Mill Company, Executive Offices: 850 Curtis Street, Middletown, Ohio.

ARMCO STEEL BORN OF RESEARCH

Birmingham Foundry Conference on Cupola Sets Attendance Record

(*Concluded from Page* 52)

signed that the crane operator can charge the cupola without leaving the cage. When the box is spotted over the charging machine, ready to be lowered, the crane cage is in such a position that the operator has full view of the charger and can see through the charging door to the inside of the cupola. A valve controlling a hydraulic cylinder is attached to the cupola shell within easy reach from the cage. By operating the valve, the pressure underneath the plunger of the hydraulic cylinder gradually is relieved and the carriage with tilting frame and box is started by gravity on its way toward the charging door. Mr. Guldberg stated that while there can be no charging equipment suitable for all requirements, as each cupola installation has its own peculiar problems, American Cast Iron Pipe Co. believes its charger provides best results from the standpoint of production, maintenance and cost.

Plant Builds Own Charger

A paper, "We Built Our Own Skip Hoist Charger," was presented by E. B. Bradley, Phillips & Buttorff Mfg. Co., Nashville, Tenn. The speaker discussed the special needs of his foundry which melts an average of 75 tons per day in two cupolas, the metal being poured in stove plate castings. Charging equipment consists of a trackway running from the makeup yard up over the roof of the foundry, splitting into a Y in front of two stacks 15 feet apart. Each leg of the Y enters a cupola charging door 21 feet above the bed. At the charging doors an auxiliary dump track is gaged a foot wider than the regular car track to engage outboard rear wheels of the car for dumping as the nose enters the doors.

The all-steel car which carries the charge to the cupola resembles half a small boiler on wheels with the nose torpedoed step cut. The car holds a complete 2000 pounds of stove plate iron, coke and limestone. The rear 2 feet of the car is separated from the rest by a semicircular sheet of steel hinged at the top so that it swings easily. Mr. Bradley pointed out that this partition is held in place by a pin through the side of the car and forms a coke box holding 6 or 7 cubic feet. The car is handled in the usual skip hoist manner by a cable running through a series of sheaves to a standard elevator drum hoist located below the trackway. Hoisting and dumping is controlled by a switchboard. Features stressed in this installation include low cost, simplicity, continuous operation, low upkeep, and effective charging.

Advantages of charging by hand were outlined by Lynn Malloy, Anniston Foundry Co., Anniston, Ala., who described the method employed at Anniston. He stressed the point that foundrymen should see that the cupola melting report balances with the stock pile.

A paper, "Foundry Control with Mechanical Cupola Charging as Practiced by the Caterpillar Tractor Co.," by M. J. Gregory, Caterpillar Tractor Co., Peoria, Ill., discussed the why and how of mechanical charging; cupola control; and metal mixtures and their control.

The Caterpillar company melts 400 tons a day, the entire amount being handled by four men. A magnet makes up the charges, a knife switch permitting accurate amounts of iron to be dropped into the scale. The company uses briquets of cast iron borings and steel turnings, the steel briquets being 69 per cent solid, and the cast iron 81 per cent solid. Two types of buckets are used in charging. Metal is charged in a cone bottom bucket and the coke and limestone in a hinged, split-bottom bucket. The latter keeps the limestone away from the lining.

Conditions Regulated Closely

Mr. Gregory stressed the accuracy of the method employed in making up the charge, and stated that the magnet method produces excellent results. Uniform, hot iron is obtained; at the spout, temperature runs about 2850 degrees Fahr. and is checked every 15 minutes. The coke bed is from 60 to 65 inches above a single row of tuyeres. Two funnels are provided at the spout, one for adding alloys and one for adding graphite to the metal. Extra coke is added to the third, sixth and ninth charges because this produces excellent results for the first ¾-hour operation and also does away with later difficulties. It was said iron at the spout costs $16 a ton, exclusive of alloys.

The final session was devoted to a paper, "Section of Cupola Blowing Equipment," by S. D. Moxley and W. Thomas Barr, American Cast Iron Pipe Co., Birmingham. After describing various factors and characteristics of different types of blowers, Mr. Moxley concluded that a thorough analysis of the metallurgical and operating conditions should be made before selecting blower equipment. Maximum pressures and volumes should be established at the beginning. Next, average pressure and volume conditions should be studied and an assumption made to arrive at what proportion of the operating time the various pressures and volumes will be required. To meet these conditions, the best combination using each type of blower should be considered for capacity, pressure, control, etc. Selection of the particular type of equipment can be considered on the basis of installation cost and yearly power consumed.

Maintenance, flexibility, adaptability to possible future plant changes, space requirements and noise are largely local matters, according to Mr. Moxley and depend entirely on local requirements. In the speaker's opinion, each cupola blowing job has its peculiarities, therefore, no particular type of equipment is best suited for all.

Air Conditioning Text Covers Growing Industry

■ *Air Conditioning Furnaces and Unit Heaters*, by J. Ralph Dalzell; cloth, 399 pages, 5½ x 8¼ inches; published by American Technical Society, Chicago; supplied by STEEL, Cleveland, for $3; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

Growth of the application of air conditioning to domestic buildings as well as industrial and public structures has brought development of certain standards and laws. The author of this volume presents it as a text and reference book relative to the application of gravity and mechanical furnaces, air conditioning for winter and summer and the application of unit heaters to commercial and domestic heating.

He traces the steps by which the present state of the industry has been reached and defines air conditioning in its true and full meaning.

The volume is well illustrated by drawings, halftones, charts and tables and an index makes reference to details easy.

The various chapters treat ventilation, heating and cooling loads, insulation, gravity and mechanical warm air furnaces, air-conditioning furnaces, registers and grilles, electric heating, humidification, unit heaters and automatic controls.

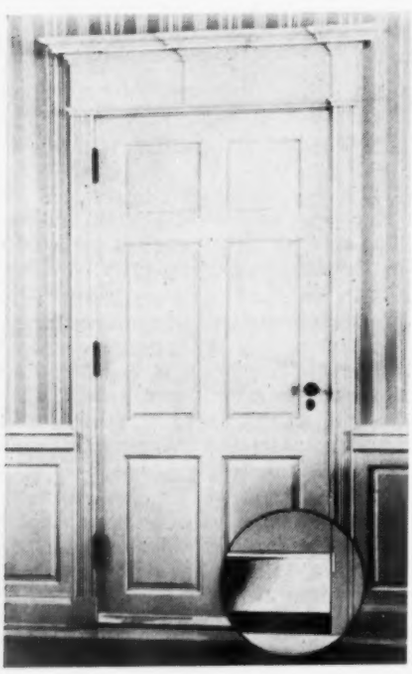
Two codes are presented, giving standard methods of design, with recommended specifications, as a guide for engineers in the field. The aim throughout has been to show how things are done as well as to explain briefly the engineering principles involved.

NEW METAL PRODUCTS

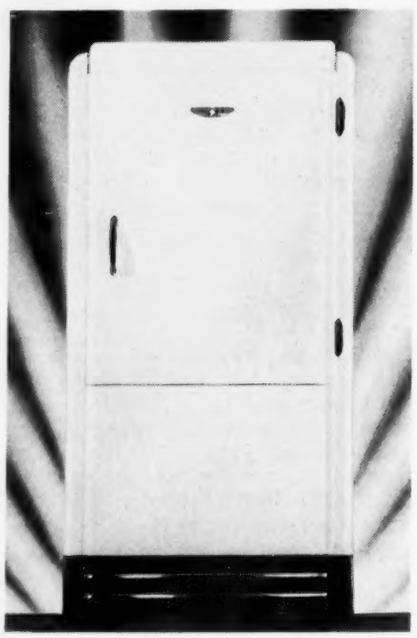
■ Malleable iron posts for guard railings can now be furnished in small or large quantities from a complete set of production patterns, according to Lake City Malleable Co., 5000 Lakeside avenue, Cleveland. There are four types of bases applicable to either two or three rail posts. These rust-resisting and shockproof railing posts are ready for installation when delivered.

■ Segal Lock & Hardware Co., 261 Broadway, New York, has announced the development of a pickproof lock, claiming it to be the first key lock that cannot be opened by any device other than the owner's key. The pickproof invention can be installed on any lock in present use by merely replacing cylinder.

■ Sentry Stop-A-Draft is the name of a new device for stopping underdoor drafts and thus saving fuel. Developed by Raysteel Specialties Inc., 449 Terminal Tower building, Cleveland, it is formed of 21-gage cold-rolled strip steel, stamped, folded and ends closed by welding. The mechanism consists of a length of cold drawn steel shafting and steel cams which operate on brass bearings to raise and lower a steel band bent to hold a length of felt. When the door is closed the end of the shaft is engaged by a jamb stop attached to the door frame on the knob side, lowering the felt to the threshhold and stopping drafts. When the door is opened the felt is raised by the action of two springs. The device is made in widths to fit all standard doors and is furnished with various finishes, including light ivory, walnut and mahogany air dry lacquers, grained patterns of bake enamels in various shades, and brass and chromium plated.

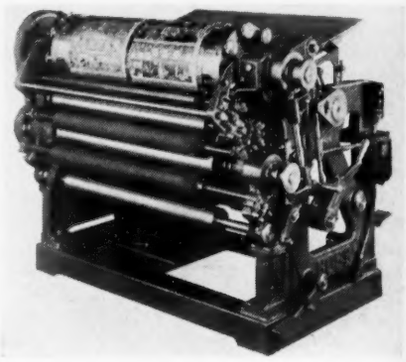


■ A refrigerator styled by Clement Thelander, Chicago, is the latest addition to the Speed Queen line of Barlow & Seelig Mfg. Co., Ripon, Wis., manufacturers of washing and ironing machines. Cabinet of the new refrigerator is of welded steel construction with exterior finish of white Dulux; the interior is white porcelain enamel. Hardware and base trim are satin finish chrome.



■ Of metal construction, the Bendix hydraulic steering stabilizer is a new product of Bendix Products Corp., South Bend, Ind. For automobiles, trucks or buses, the stabilizer absorbs road shocks, prevents front wheel shimmy and corrects many steering dangers in addition to holding machine on its course when a blowout or sudden road shock occurs.

■ Something new in the field of graphic arts is the new Pre-make-ready Press of Goss Printing Press Co., 1535 South Paulina street, Chicago. On this new unit, pressman can register his plates and complete makeready before plates and packing are transferred to printing press, where they will then print properly. Plate and impression cylinders are equipped with bearing rings. Unit is driven by a 3-horsepower motor. Side frames, base, levers, etc. are of cast iron, gears of chrome nickel iron castings, brushings of bronze alloy. Construction involves a great variety of steels such as cast, medium carbon, cold-rolled, and heat treated nickel.



■ Lincoln Engineering Co., 5701 Natural Bridge avenue, St. Louis, has placed on the market an attractive new streamlined design wall battery and portable automotive lubricating unit for garages and service stations. Lubricants are dispensed from the original containers which are placed inside the cabinets. Access is by an easily removable front. These battery units are constructed of welded heavy sheet steel, reinforced with Z-bars. The exterior finish is of white oilproof synthetic enamel which is trimmed in red with strips of stainless steel. Specially decorated models are available for automotive service stations handling the popular priced lines of cars.

■ Comptodesk, 1514 Tribune Tower, Chicago, is introducing a desk designed for calculating machines. The Comptodesk itself is all steel, electrically welded, and involves no bolts. Sides are full paneled, there is a five gang plug for electrical connections, and the top is of non-glare, stainless linoleum. A novel feature is Sectionettes, drawer units which may be attached to the desks as optional equipment.

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By ROBERT E. KINKEAD

On this page the author, well-known consulting engineer in welding is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL

Welding Symbols Used By Army Engineers

■ Complete welding symbols adopted by American Welding society are used on drawings recently issued by St. Louis division of the United States Army engineers covering Mississippi river lock & dam No. 24, 80 x 25 feet tainter gate welded. Materials, procedure and size of welds are completely specified so that bidders will all have to compete on an equal basis.

Distinguished always for the perfection of their specifications and drawings, the United States Army engineers have set a standard for welding specifications and drawings in this instance which will be followed by others on construction involving heavy responsibility for correct welding methods.

The question of whether such perfection may be justified in manufacturing plants is one that can only be answered in specific cases. Thus, in the case where drawings are prepared for construction involving many repeat operations and where the slightest error or misinterpretation might cause a heavy loss, such complete specifications on the permanent drawings would certainly be justified. On the other hand, machinery bases of non standard design might be specified with much less detail. It is argued that once the symbols and specifications are completely learned, the extra labor of doing a good job is small compared with the possible loss from misinterpretation resulting from casual specifications.

Welding Costs Due For Revamping

■ As signs multiply that the Roosevelt depression promises to let up a little, many manufacturing executives are looking at their welding departments and wondering what should be done about existing conditions.

Here are some of the things which need attention in most cases.

Establish a yardstick of achievement for the department to be assured that costs are being reduced not increased, check designs to see what cost reductions may be made in this direction, re-vamp material handling equipment and check welding processes used against developments of the last year.

It is a safe prediction to make that any company which does not make a 20% reduction in unit welding cost in 1938 as compared with 1937 is overlooking a good many advances in the field of welding. No one overlooks such savings intentionally. If such savings are not made it is because the responsible executive does not know how.

No cost reduction program ever amounts to much when followed erratically. Low costs are obtained by establishing a measure of achievement and everlastingly sticking to the job of saving waste. More depends on executive encouragement than on any single factor.

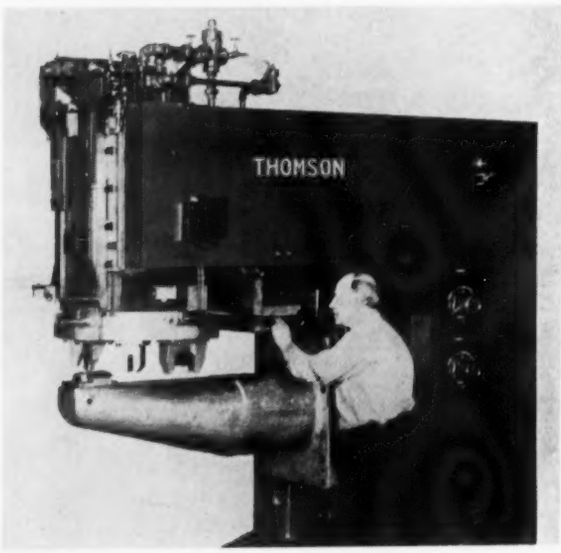
Known Welding Facts Should Be Compiled

■ A manufacturer recently inquired where his supervisor of welding could obtain a course of training in the metallurgy of welding with particular reference to the low alloys. The only hope at the present moment is a course in ordinary metallurgy. The American Welding society in Cleveland has such a course running currently with Harry Pulsifer of American Steel & Wire Co. as lecturer.

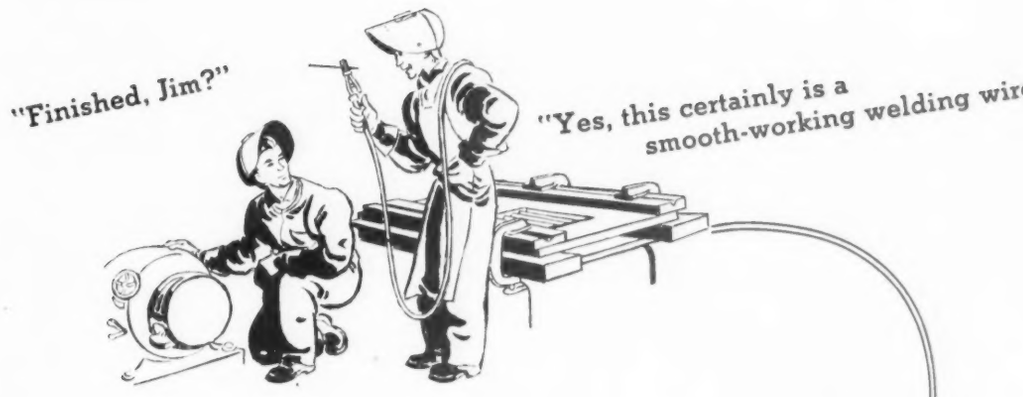
Conducted by a man of Mr. Pulsifer's professional attainments such a course is of great value. However, much remains to be done to develop in such a form as to be taught the scattered information available on the metallurgy of welding as distinguished from ordinary metallurgy. Steel metallurgy contemplates making steel in a furnace over a period of several hours. Almost all of the welding processes are accomplished with the metal molten for a period of a few seconds and whipping through the critical points in cooling during a fraction of one second. Metallurgical events happen in welding that are not in the book of ordinary metallurgy due to these short time intervals.

A few years ago when the metals society was known as steel treaters, the welders were always introduced as the steel mistreaters and with reason. The metallurgy of welding is a highly specialized branch of knowledge and a great deal needs to be done in the direction of getting what is known about it into print for the benefit of the industry.

Turret Head For Multiple Welding Operations



■ Saving a lot of work handling and assembly time, this Thomson hydraulic press welder completes four or more different welds without removal from the machine. Turret with various electrodes revolves and separate limit switches automatically control current dwell at each station. Unit is made by Thomson - Gibb Electric Welding Co., Lynn, Mass.



NO time lost when Roebling Welding Wire is used. No necessity for current changes... for this wire is always the same.

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New Laboratory Features Elaborate Equipment

■ Accompanying views show the new research laboratory of American Rolling Mill Co., Middletown, O., and some of the equipment installed in it.

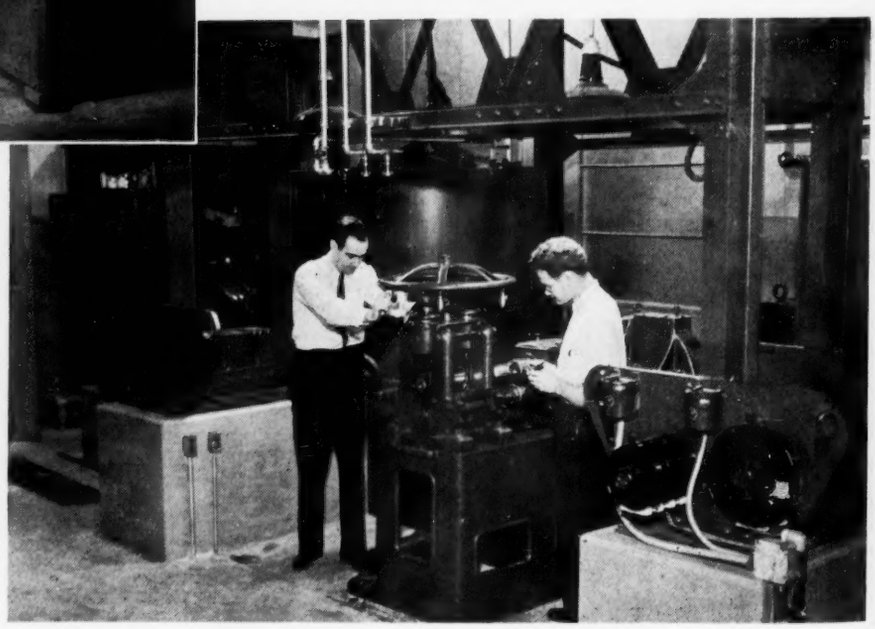
Apparatus included in the new laboratory is complete in that it permits duplication of all processes involved in making iron and steel. Such advanced equipment as the vacuum fusion setup shown and high frequency induction furnaces for studying alloys will aid the 12-point research program now under way.

One of the important parts of this program consists in setting up complete tests for determining and maintaining the quality of all of the company's products. Another significant study is centered around the elimination of sound in metal products.

Development of better sheets for porcelain enameling is receiving attention along with other projects which include production of highly finished sheets for deep drawing purposes, lower loss sheets for electrical equipment, new stainless steels as well as improved lead, zinc and other metallic coatings for sheets. This latter will be supplemented by a study of nonmetallic coatings such as asbestos, asphalt, paint, lacquers and synthetic enamels in addition to surfaces to better hold such coatings.

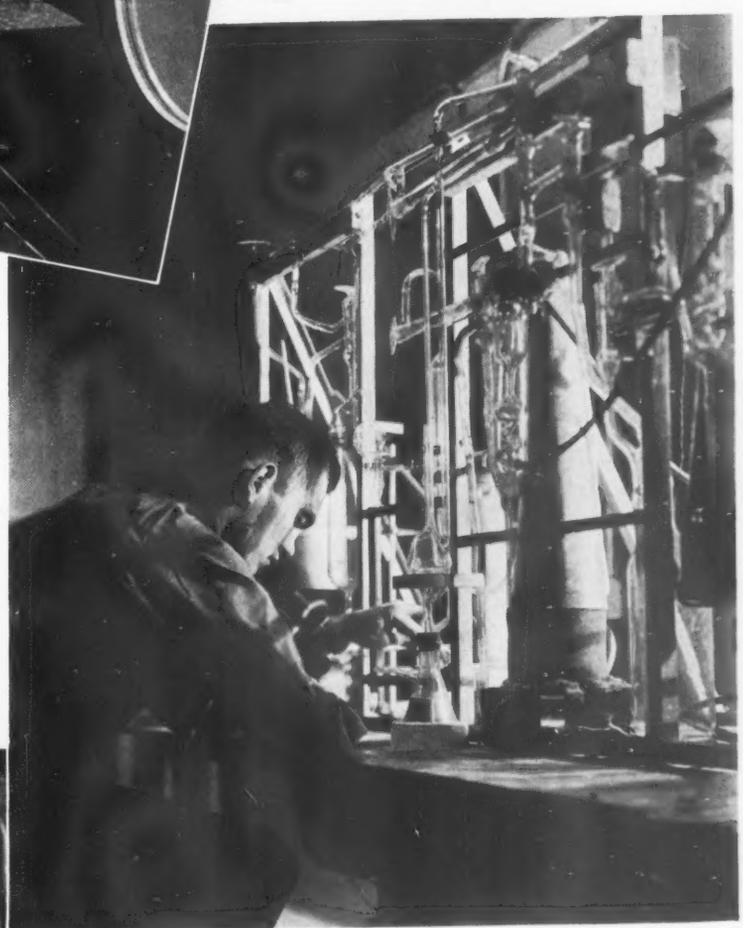
Rolled car wheels and low priced, corrosion resistant sheets and strip are included in the research program. Other studies center around weldable flat rolled materials, and, of course, practice with respect to blast furnace, open hearth and electric furnace operations.

■ Electrically heated, experimental, annealing furnace shown above is capable of reaching a temperature of 2300 degrees Fahr. It is one of four small furnaces of various sizes in which annealing and heat treating tests are conducted

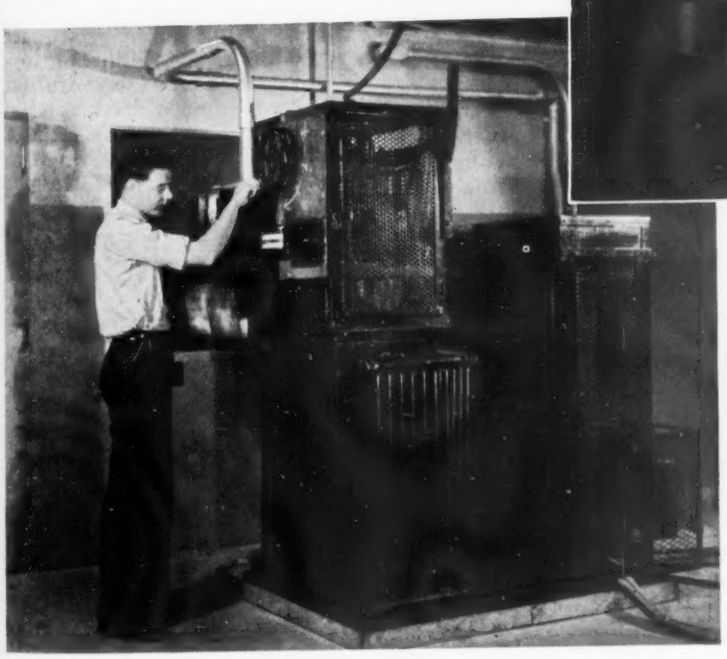


■ Miniature rolling mill at right is used for hot and cold rolling tests and eliminates necessity of trying out new metals on the large mill. This and other equipment duplicates all processes involved in making sheets

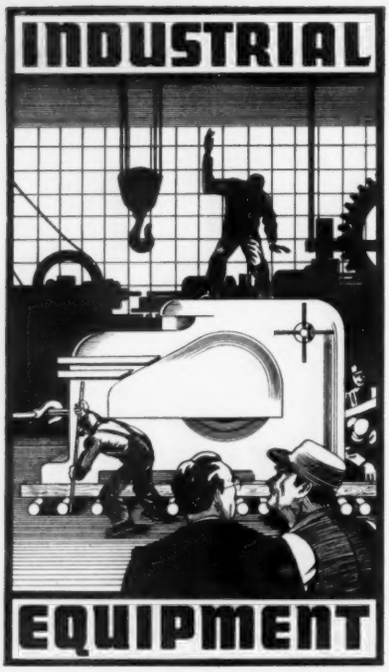
■ In the enameling laboratory at left, the microscope reveals surface structure of a sheet that has just been enameled for experimental purposes. All types of tests can be made on enameling iron in these laboratories



■ While iron is under high vacuum, the percentages of oxygen, hydrogen and nitrogen are determined in this vacuum fusion apparatus. These laboratory experiments help open hearth men to control deoxidation. It is possible to measure one-millionth of an atmospheric pressure in this setup



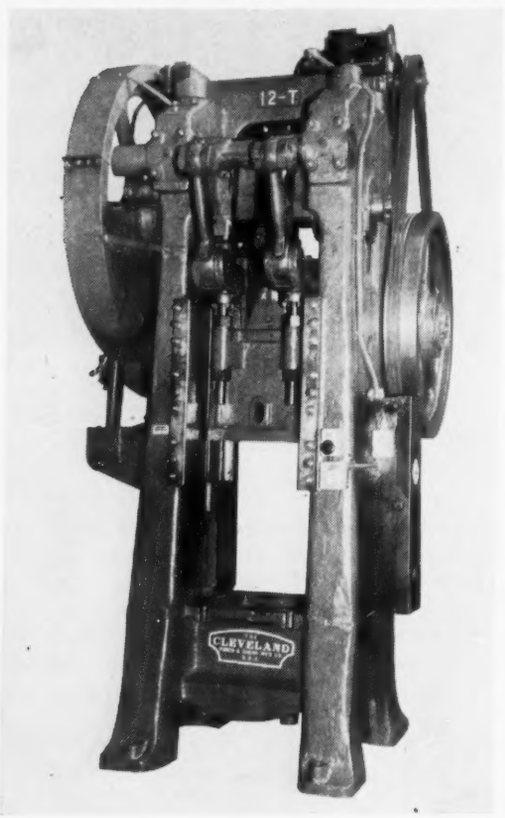
■ Here a high frequency generator provides current for small experimental heats of alloys in induction furnaces. Tests with 30-pound heats make possible complete tests of many alloy combinations each day, greatly broadening the scope of alloy iron studies



Press Is Designed To Economize Space

■ Cleveland Punch & Shear Works Co., 3917 St. Clair avenue, Cleveland, has introduced a 12-T single crank, double action toggle press which is designed for economical use for floor space.

Press is equipped with an electrically controlled, hydraulically operated friction clutch. The customary outboard bracket has been eliminated and the clutch and gearing are now located between the uprights. Press operates at the rate of 17 strokes per minute. It has a bed area of 28 inches front to back and 26 inches right to left. The plunger has a 20-inch stroke with a 4-inch adjustment.



With the elimination of the customary outboard bracket, this Cleveland press now economizes all possible floor space. Clutch and gearing are located between the uprights. Unit operates at the rate of 17 strokes per minute

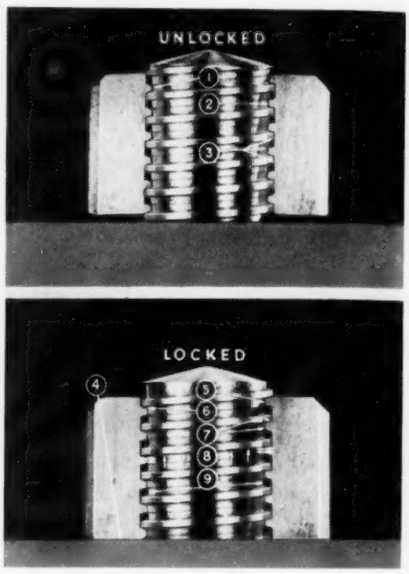
Self-Locking Thread Unaffected by Vibration

■ Dardelet Threadlock Corp., 55 Liberty street, New York, has placed on the market a self-locking screw thread known as the Relieved Profile which is claimed to be unaffected by vibration, loss of bolt tension or wear of the bearing surfaces of the assembled members.

Root of the bolt thread with the Relieved Profile is stepped at the mid-point and each step is tapered 6 degrees with the axis of the screw (1). The lower step is undercut 0.003 to 0.005 inches, depending upon the nominal diameter of the thread. Tapered crest of the nut thread remains the same (2). A clearance (3) exists between the assembled bolt and nut threads permitting a limited axial displacement which provides for a change in relative thread positions from unlocked to locked.

When the free spinning nut meets the work a wrench is applied to it (4). This initial wrenching effort immediately produces a bolt tension or pull because clearance provided by relief feature permits only a line contact on the locking surfaces of both bolt and nut threads at this stage of assembly. Continued wrenching effort increases bolt stress sufficiently to change position of nut thread relative to the bolt thread, gradually forcing nut thread upward along tapered slope of bolt thread to the point of its greatest taper diameter (5). Thus locking action is built up gradually by increasing area of locking surfaces in contact and securing increased bolt tension. With the abutting thread flanks in contact (6) additional wrenching develops required bolt stress while maintaining lock.

Bolt stress is distributed between the flanks of bolt thread ridge and bolt thread root surface (7). Locking stresses function approximately at right angles to the bolt tension (8) and thus the resultant gripping action keeps the lock from being affected by vibration. Greater minimum thread diameter without V-angles to start fracture provides greater strength (9).



Illustrated Dardelet Relieved Profile shows bolt and nut threads, first (top picture) in the unlocked and then in the locked positions

Rolling Machine Forms Ventilating Ducts

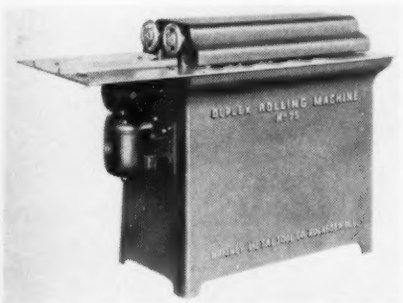
■ Whitney Metal Tool Co., Rockford, Ill., has introduced a rolling machine which makes air conditioning, ventilating ducts and other similar forms using folded seams.

The machine features a double set of rollers permitting one set to be used for forming corner locks and the other for drive cleats or some similar folded form. Either or both sets of rolls may be used at any time so that no changeover of the machine is required when

switching over from one type of work to the other. Rolls can be furnished to suit the requirements.

Unit has a high capacity and speed, and will handle material up to 18-gage thickness. It feeds the sheet through the rolls at the speed of 38 feet per minute. Unit is powered by a 1-horsepower motor.

Rolls are adjusted for the thickness of the metal being formed by means of a handwheel with a micrometer scale for accurate setting. This handwheel sets all of the rolls simultaneously by means of a special bar cam. The rolls are carried on 1⅜-inch spindles mounted in two heavy needle-type roller bearings, and are driven through helical gears at the center of the spindle between the bearings.



In this Whitney rolling machine both sets of rollers may be used at any time so that no changeover of the machine is required when switching over from one type of work to another

The extension feed table has adjustable guide bars which can be set to control the amount of overhang as desired when running corner locks. All working parts and the base are covered with a sheet metal case which has wide-radius corners giving a smooth and neat appearance. Base is of welded angle and plate construction, amply reinforced for rigidity and two of the feet have adjustable leveling screws for setting the machine properly on an irregular floor.

Throttling Controller Holds Temperature

■ C. J. Tagliabue Mfg. Co., Park and Nostrand avenues, Brooklyn, N. Y., has introduced a Celectray throttling controller for electric furnaces which varies the heat supply inversely as the temperature.

Controller is of the indicating potentiometric type which photoelectrically detects the position of a light beam reflected from a mirror galvanometer towards a reciprocating controlling edge. Instrument has no measurable dead zone and holds a steady temperature. Life of the furnace switch or magnetic contactor is maintained by selecting the frequency of cycles according to the power requirements. Throttling zone can be readily adjusted within wide limits and the load error commonly met in throttling controllers can be kept within a few degrees. Adjustment for load error also is provided.

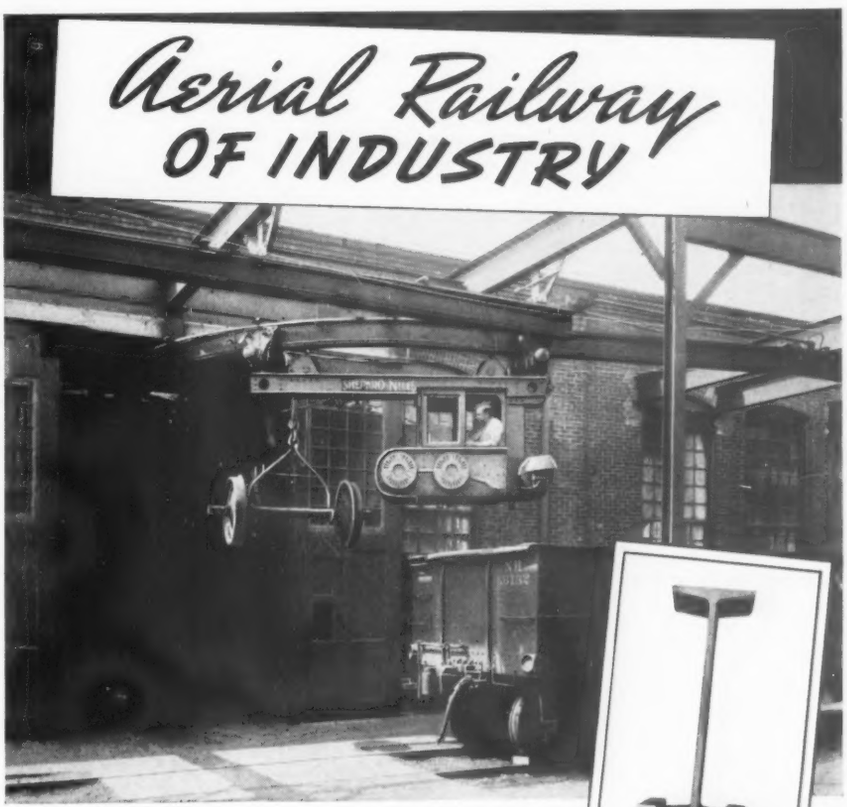
For safety, power is shut off from the controller the moment the lamp is burned out. The instrument is resistant to vibration but shockproof mountings are available if desired. Circular scale and slide wire of the unit are 15 inches long, and temperatures can be read within 0.1 degrees of the range. The scale appears through a glass window, and temperatures are indicated by a bright white, red or green line of light on the ground glass. Light is visible at great distances.

Machine Cam Operated

■ General Electric Co., Schenectady, N. Y., has placed on the market a circuit breaker mechanism to supersede the centrifugal motor mechanism formerly used to operate type FH oil-blast circuit breakers.

The type ME-10 mechanism is a

Aerial Railway OF INDUSTRY



Several departments in two separate buildings are served by this Shepard Niles monorail hoist

Shepard Track consisting of two special analysis T-rails clamped to the bottom flange of a standard I-Beam insures a smooth, hard, long-wearing track for monorail hoists.

● One Shepard Niles electric monorail hoist gives "express service", indoors or out, to any point in the plant or yard carrying loads of every description. Furnished with single or double hooks in capacities from ⅛ to 10 tons.

They are also ideally suited to the accurate control of any standard electro-magnet or grab bucket.

Write for catalogs illustrating and describing the "Aerial Railway of Industry".

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high-speed motor driven cam device which is smoothly driven by a direct current. It requires no adjustments and takes about 4 inches less headroom than the old type.

Cam acts against a roller connected to a standard trip-free linkage. At the end of the closing stroke, motor is electrically disconnected and the excess energy of the cam is absorbed by a dashpot. The cam is returned back to the starting position by a spring. Proportioning of closing force to closing requirements of the breaker provides a high-speed closing without undue shock or overtravel at the end of the stroke. The high power supplies the force for compressing the springs required for a quick opening.

Pumps Chemicals

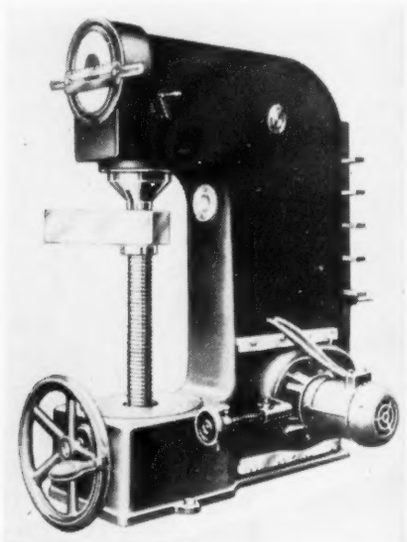
■ Worthington Pump & Machinery Corp., Harrison, N. J., has introduced a line of rotary pumps designed to pump viscous chemicals.

Ruggedly constructed, the units pump chemicals such as sulphonated oils, fatty acids, tallows, tars, asphalts, glues, gelatins, animal and vegetable oils, molasses, sugar syrups, glucose, cellulose acetates and nitrates, viscose, rayons, cellophane and various film dopes.

Pumps are available in iron, bronze, monel, nickel, everdur, stainless steel and aluminum. They may be obtained for capacities up to 700 gallons per minute, and pressures up to 150 pounds per square inch and for viscosities up to 110,000 centipoises.

Quantities of Metal Tested by Special Unit

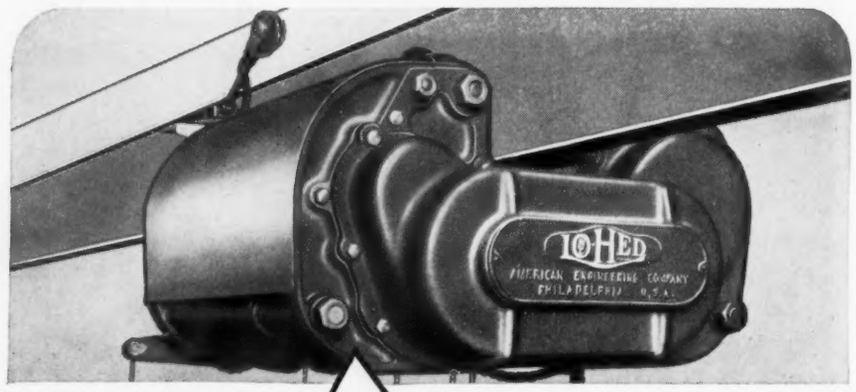
■ Herman A. Holz, 167 East Thirty-Third street, New York, has placed on the market a reflex-brinell type hardness testing machine which has been specially constructed for the application of the standard brinell hardness tests in routine production testing of large quantities of metal sections such as forgings, machine parts and springs.



Greatly magnified image of the brinell ball impression appears upon the ground glass of this Herman A. Holz reflex-brinell type, hardness testing machine

After the standard 3000 kilogram load has been listed by the action of the electric motor, the greatly magnified image of the brinell ball impression appears on the ground glass together with the measuring scale. Limits of the smallest and the largest permissible diameters can be marked on ground glass so operator need only to watch to see if impression diameters fall within the prescribed limits.

Loading and unloading of test pressures are effected automatically by electric motor drive. The test-cycles are adjustable from 10 to 60 seconds each, as desired. Standard specifications of the brinell test require that measurements be based upon the diameters of the ball impressions.



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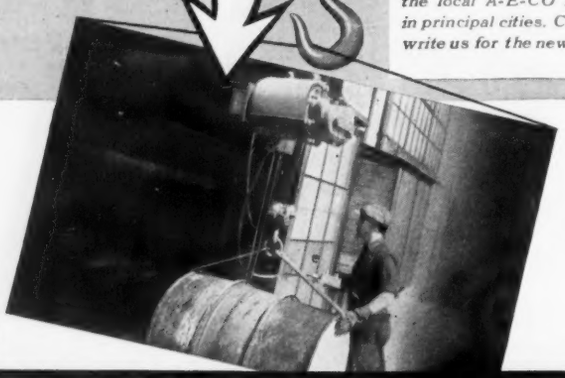


AECO Lo-Hed HOIST

AMERICAN ENGINEERING COMPANY

2484 ARAMINGO AVENUE, PHILADELPHIA, PA.

Modernized Handling System Shows Economy

(*Concluded from Page* 56)

gether with a portable electric butt welder for continuous drawing.

Redrawn wire to be galvanized before weaving is wound in coils. Other wire is wound on steel spools, each holding from 26 to 130 pounds of wire, depending upon the diameter and use to be made of it. The coils and spools are loaded on cradle skids and taken to the annealing furnace. The spools are piled on special circular trays, each holding about a dozen spools. These trays, with a stem for lifting, are set in and removed from the furnace by the traveling crane. In some cases these trays of cooled, annealed wire are taken to the fence machines on flat skid platforms. In other cases the spools are repiled on cradle skids for handling.

Wire Is Trucked

Wire to be galvanized before using is trucked to the galvanizing department over a second drawbridge, which has considerable incline. The electric truck does not enter the department, however. When the track car system was in use, the cars were raised and lowered on this incline by a hand winch. The rails are set out to the edge of the drawbridge to serve as a guide and guard to prevent the truck running off the incline.

Chicken netting is woven in 600-foot rolls of standard widths, varying from 12 to 96 inches, with 1 to 2-inch hexagon as standard. Fencing of narrow width is woven in multiples up to the full 96 inches, as two 48's or four 24's. Other special widths and hexagons and graduated fencing (beginning with fine mesh and increasing the mesh with the width) are woven on special order.

Chicken fencing woven from galvanized wire is rewound in a tight roll in 150-foot lengths. Other wire is sent across on the truck to be galvanized and then rewound. Rolls are stored on the second floor and lifted by a continuous vertical chain elevator with pairs of projecting curved arms, similar to the type used for lifting barrels. Stock is lowered for shipment on this same conveyor by reversing the direction of travel.

Hardware cloth is woven on a loom in an operation somewhat similar to old-fashioned rag carpet weaving. This cloth is made in various meshes and widths and up to 250 feet in length. Most of the cloth is woven from galvanized wire although some of it is galvanized or regalvanized after weaving. The handling of the rolls is very similar to that used for handling chicken fencing.

This department had been located on the second floor, which required handling up and down. Moving it to the first floor permits servicing by truck. The space formerly occupied is now used for storage, as the comparatively light but bulky coils may be handled up and down more easily than the spools of wire.

One man operates the truck all of the time although two other men have been trained to do the work in case of absence or illness. The battery is often recharged at night.

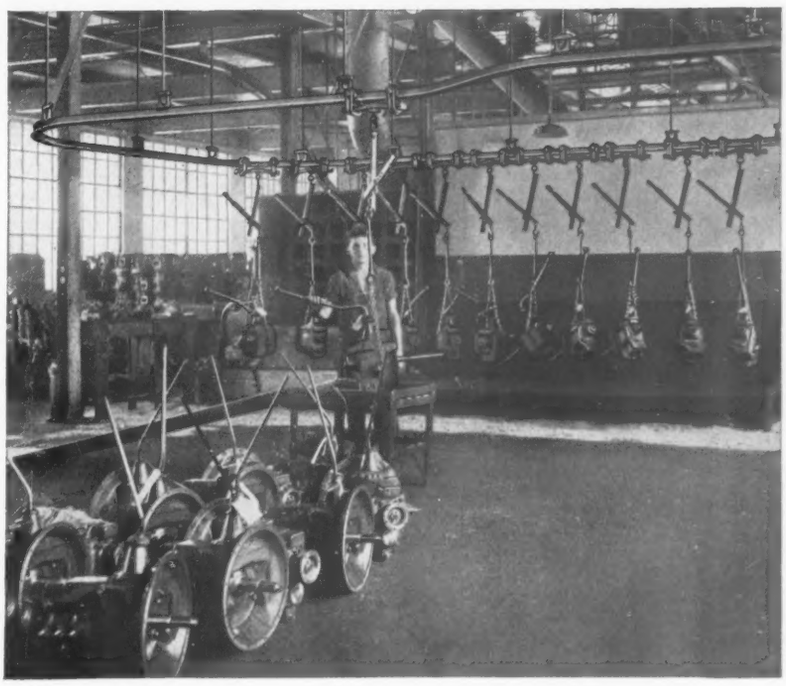
In the new handling system the wire moves from the baking of coils of rod to the storeroom for finished products with practically no back travel except for the return for annealing after first and second drawing operations. The chief advantage of the change in handling from narrow-gage track to electric truck is in the ease of moving the work at any time without the former difficulty of loads passing each other.

In the wire drawing department the wire is weighed up every morning, as the men are paid according to production. This weighing op-

CLEVELAND TRAMRAIL

MATERIALS HANDLING EQUIPMENT

For Manual or Motor Operation



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eration formerly required about 4 hours daily. Now it is done in about 1½ hours. The result is a saving of about 2½ hours in production time each day, which, evaluated at only $1 per hour, would mean from $500 to $750 per year. The saving, due to not having to switch cars around, is more difficult to estimate but in all probability amounts to about as much.

In another group of handling operations, three men in 45 minutes now do work which formerly required four men 1½ hours, or a daily saving of 3¼ hours of labor. These and many other similar savings in time have made the truck and skids a very profitable investment.

♦

Name More Officers for Foundrymen's Group

■ The newly formed Metropolitan chapter of the American Foundrymen's association held its second monthly meeting in New York, Feb. 21. Chairman Donald J. Reese, International Nickel Co. Inc., Bayonne, N. J., announced that Samuel Frankel, Howard Kramer & Co., New York, had been named treasurer, and W. A. Phair, associate editor, *Iron Age*, New York, had been elected to the directorate which now comprises four members.

F. G. Sefing, International Nickel Co. Inc., Bayonne, N. J., chairman of the by-laws committee, presented a report incorporating a set of by-laws for the organization. This report was approved.

Technical portion of the meeting was a paper, "Nonferrous Casting Defects—Their Causes and Cures," by Sam Tour, vice president, Lucius Pitkin Inc., New York.

Desulphurizing Is Topic At Newark Meeting

■ Modern technique in desulphurizing cupola metal and the advantages of the process were discussed by George S. Evans, metallurgist, Mathieson Alkali Works, New York, at a meeting of the New Jersey Foundrymen's association in Newark, N. J., Feb. 23. Tracing first the history of desulphurizing, the speaker centered his remarks on the application of fused sodium carbonate, which he commonly referred to as Purite.

He stated the particular value of this material as a refining agent for cast iron is due to its power to form highly active, fluid slags at cupola melting temperatures, and to the rapidity of the reactions within the slag at these temperatures. It is these properties which make it possible to refine the metal from the cupola spout within time limits and temperatures losses allowable in average foundry operations.

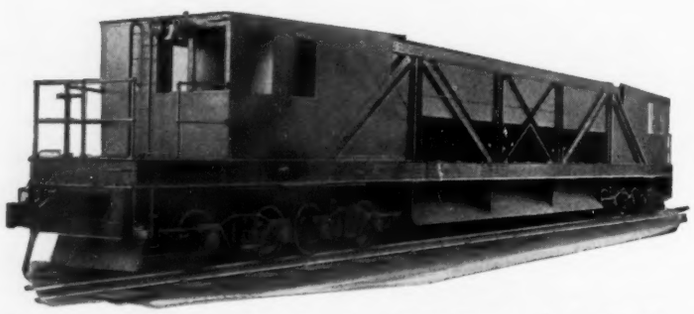
More recently, Mr. Evans said, use of fused sodium carbonate has extended to blast furnace and open-hearth steel practice.

Practical usage has established the economic value of sodium carbonate in the cupola as a means of improving combustion, also for influencing entrained oxide-silicon inclusion which sometimes show up as hard spots in light section castings. As a result, some improvements in fluidity of the metal and in machinability of the finished castings will be noticed generally.

The percentage of scrap can be increased moderately in most cases with this use in the cupola. However, he added, where it is desired to use high scrap mixture in the production of castings that require machining, or where the sulphur must be held within specified limits, the combined use of small quantities in the cupola coupled with desulphurizing in a teapot mixing ladle generally is to be preferred.

Some reference was made to the production of castings from 100 per cent scrap mixtures, particularly in the southwest where foundries are far removed from blast furnaces and where there is an over supply of high-grade oil country scrap.

ATLAS ORE TRANSFERS



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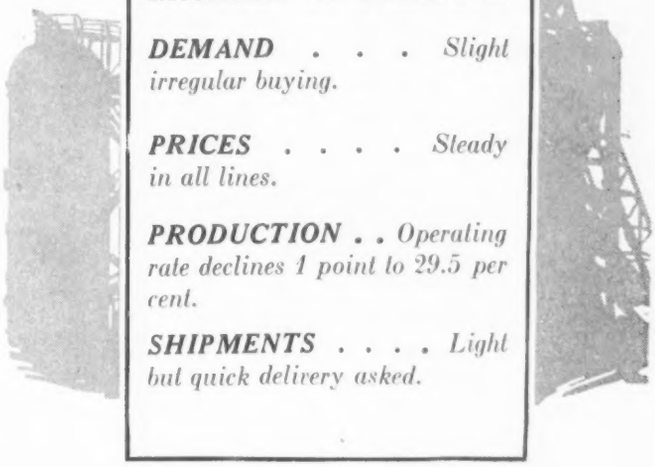
Steel Demand Shows Small Upward Trend

Ship Steel Coming Out; Rail Buying Starts; Scrap Lower



MARKET IN TABLOID

DEMAND . . . *Slight irregular buying.*

PRICES . . . . *Steady in all lines.*

PRODUCTION . . *Operating rate declines 1 point to 29.5 per cent.*

SHIPMENTS . . . . *Light but quick delivery asked.*

■ IMPROVEMENT in steel buying is slight and irregular but most mills find somewhat broader demand and a gradual, though slow, tendency upward.

In general steel consumers continue the waiting attitude that has characterized the situation for many weeks, showing no inclination to accumulate stocks. Requests for immediate shipment indicate little steel is in consumer hands. It is becoming increasingly evident many steel users have large inventory of their manufactured products and will not buy freely until these have begun to move. Inability of the motor industry to get under way is a considerable deterrent to steel production. The outcome of the present drive to break the used car jam is awaited with interest.

Agricultural implement makers supply one of the brightest spots in the situation, maintaining schedules at a rate relatively higher than other steel consumers. With surveys of farm cash income indicating purchasing power almost equal to that of last year a good rate of buying is expected. Farm equipment suppliers expect some decline from last year's sales but an excellent volume, nevertheless. Federal agencies forecast a decline of only 10 per cent in cash returns to farmers for first half.

Continued scattered buying by railroads indicates needs are pressing and cannot be restrained until the rate petition is answered. Last week Chicago rail mills booked about 30,000 tons of rails for March and April delivery, buyers not being announced. Track maintenance is likely to give more immediate steel buying than for equipment, though some of the latter is trickling out.

Award by the maritime commission of four of the 12 cargo boats on which bids were taken some time ago gives hope the remaining eight will be placed soon. The four ships will require about 20,000 tons of steel. Other shipbuilding construction is bringing tonnage, the navy placing 3625 tons for destroyers building at navy yards.

Still holding close to 30 per cent of capacity, as it has done since the middle of January, the national ingot operating rate dropped 1 point last week, to 29.5 per cent. Slight losses, some due to staggered operation, were shown in six areas, no change was made in five districts and a small gain was reported in one. Chicago advanced 2 points to 26.5 per cent. Pittsburgh dropped 1 point to 27, Birmingham 3 points to 58, New England 12 points to 15, Cincinnati 25 points to 10, Detroit 8 points to 35 and Cleveland 3 points to 28. No change was made at Youngstown at 29 per cent, St. Louis at 28, Buffalo at 21, Wheeling at 38 and Eastern Pennsylvania at 30.

Pig iron production in February made a gain of 47 tons in the daily rate, 0.1 per cent over January. The daily rate was 46,655 tons, compared with 46,608 tons in January. Total production in February was 1,306,333 tons, 9.6 per cent lower than the 1,444,862 tons in January. The February record is the lowest since December, 1934, when total production was 1,028,006 tons, with a daily rate of 33,161 tons. It was the lowest February since 1934 when output was 1,270,792 tons at a daily rate of 45,385 tons.

Steel and iron imports in January were 29,409 gross tons, an increase of 17.1 per cent over December, but 21.8 per cent below the monthly average for 1937 and 27.6 per cent smaller than in January, 1937. Pig iron was the leading article, most coming from British India and the Netherlands. Scrap imports were the lowest in many months at 222 tons.

Production of automobiles last week at 54,440 units was 2537 lower than the preceding week. General Motors made 23,750 compared with 21,950 the preceding week, Chrysler 11,150 compared with 10,450, Ford 11,500 compared with 15,570 and other makers 8040 compared with 9007.

With prices of scrap largely nominal in absence of buying, except for export, adjustments to lower levels last week caused the composite of steelmaking grades to decline 12 cents to $13.13. This is the lowest point for this indicator since about the middle of December. Changes in scrap quotations had no effect on the iron and steel composite, which remains at $38.84. The finished steel composite shows no change from $61.70, which has held for many months.

COMPOSITE MARKET AVERAGES

	Mar. 5	Feb. 26	Feb. 19	One Month Ago Feb., 1938	Three Months Ago Dec., 1937	One Year Ago Mar., 1937	Five Years Ago Mar., 1933
Iron and Steel	$38.84	$38.84	$38.88	$38.90	$38.88	$39.92	$27.92
Finished Steel	61.70	61.70	61.70	61.70	61.70	60.70	45.60
Steelworks Scrap..	13.13	13.25	13.33	13.54	13.24	20.95	6.47

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	Mar. 5, 1938	Feb. 1938	Dec. 1937	March 1937
Steel bars, Pittsburgh	2.45c	2.45c	2.45c	2.40c
Steel bars, Chicago	2.50	2.50	2.50	2.50
Steel bars, Philadelphia	2.75	2.75	2.75	2.74
Iron bars, Terre Haute, Ind.	2.35	2.35	2.35	2.35
Shapes, Pittsburgh	2.25	2.25	2.25	2.20
Shapes, Philadelphia	2.465	2.465	2.465	2.455
Shapes, Chicago	2.30	2.30	2.30	2.30
Tank plates, Pittsburgh	2.25	2.25	2.25	2.20
Tank plates, Philadelphia	2.445	2.445	2.445	2.435
Tank plates, Chicago	2.30	2.30	2.30	2.30
Sheets, No. 10, hot rolled, Pitts.	2.40	2.40	2.40	2.35
Sheets, No. 24, hot ann., Pitts.	3.15	3.15	3.15	3.10
Sheets, No. 24, galv., Pitts.	3.80	3.80	3.80	3.70
Sheets, No. 10, hot rolled, Gary	2.50	2.50	2.50	2.45
Sheets, No. 24, hot anneal., Gary	3.25	3.25	3.25	3.25
Sheets, No. 24, galvan., Gary	3.90	3.90	3.90	3.85
Plain wire, Pittsburgh	2.90	2.90	2.90	2.85
Tin plate, per base box, Pitts.	$5.35	$5.35	$5.35	$4.85
Wire nails, Pittsburgh	2.75	2.75	2.75	2.70

Semifinished Material

Sheet bars, open-hearth, Youngs.	$37.00	$37.00	$37.00	$36.40
Sheet bars, open-hearth, Pitts.	37.00	37.00	37.00	36.40
Billets, open-hearth, Pittsburgh	37.00	37.00	37.00	36.40
Wire rods, No. 5 to $\frac{9}{32}$-inch, Pitts.	47.00	47.00	47.00	46.20

Pig Iron

	Mar. 5, 1938	Feb. 1938	Dec. 1937	March 1937
Bessemer, del. Pittsburgh	$25.26	$25.26	$25.26	$24.85
Basic, Valley	23.50	23.50	23.50	23.10
Basic, eastern del. East. Pa.	25.34	25.34	25.34	24.76
No. 2 fdry., Pittsburgh	25.21	25.21	25.21	24.80
No. 2 fdry., Chicago	24.00	24.00	24.00	23.20
Southern No. 2, Birmingham	20.38	20.38	20.38	19.88
Southern No. 2, del. Cincinnati	23.89	23.89	23.89	23.19
No. 2X eastern, del. Phila.	26.215	26.215	26.215	25.635
Malleable, Valley	24.00	24.00	24.00	23.60
Malleable, Chicago	24.00	24.00	24.00	23.20
Lake Sup., charcoal, del. Chicago	30.24	30.24	30.24	28.95
Gray forge, del. Pittsburgh	24.17	24.17	24.17	23.75
Ferromanganese, del. Pittsburgh	107.49	107.49	107.49	90.80

Scrap

Heavy melting steel, Pittsburgh	$13.75	$14.15	$13.40	$22.40
Heavy melt. steel, No. 2, E. Pa.	12.75	13.25	13.13	18.75
Heavy melting steel, Chicago	12.00	12.15	12.40	20.90
Rails for rolling, Chicago	15.25	15.25	14.25	22.25
Railroad steel specialties, Chicago	14.25	14.85	15.75	22.35

Coke

Connellsville, furnace, ovens	$4.25	$4.25	$4.30	$4.05
Connellsville, foundry, ovens	5.25	5.25	5.25	4 25
Chicago, by-product foundry, del.	11.00	11.00	11.00	10.25

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Prices Subject to Quantity Extras and deductions (Except Galvanized)

Hot Rolled No. 10, 24-48 in.

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, del.	2.60c
New York, del.	2.74c
Philadelphia, del.	2.70c
Birmingham	2.55c
St. Louis, del.	2.63c
Granite City, Ill.	2.60c
Pac. base pts. f.o.b. cars	2.97½c

Hot Rolled Annealed No. 24

Pittsburgh	3.15c
Gary	3.25c
Chicago, delivered	3.28c
Detroit, delivered	3.35c
New York, delivered	3.49c
Philadelphia, del.	3.45c
Birmingham	3.30c
St. Louis, del.	3.38c
Granite City, Ill.	3.35c
Pac. base pts. f.o.b. cars	3.82½c

Galvanized No. 24

Pittsburgh	3.80c
Gary	3.90c
Chicago, delivered	3.93c
Philadelphia, del.	4.10c
New York, delivered	4.14c
Birmingham	3.95c
St. Louis, del.	4.03c
Granite City, Ill.	4.00c
Pac. base pts. f.o.b. cars	4.42½c

Tin Mill Black No. 28

Pittsburgh	3.30c
Gary	3.40c
St. Louis, delivered	3.53c
Granite City, Ill.	3.50c

Cold Rolled No. 10

Pittsburgh	3.00c
Gary	3.10c
Detroit, delivered	3.21c
Philadelphia, del.	3.30c
New York, del.	3.34c
St. Louis, del.	3.23c
Granite City, Ill.	3.20c
Pac. base pts. f.o.b. cars	3.62½c

Cold Rolled No. 20

Pittsburgh	3.45c
Gary	3.55c
Detroit, delivered	3.66c
Philadelphia, del.	3.75c
New York, del.	3.79c
St. Louis	3.68c
Granite City, Ill.	3.65c

Enameling Sheets

Pittsburgh, No. 10	2.90c
Pittsburgh, No. 20	3.50c
Gary, No. 10	3.00c
Gary, No. 20	3.60c
St. Louis, No. 10	3.13c
St. Louis, No. 20	3.73c

Tin and Terne Plate

Gary base, 10 cents higher

Tin plate, coke (base box) Pittsburgh	$5.35
Waste-waste, 2.80c; strip	2.50c
Long ternes, No. 24, unassorted, Pitts.	4.10c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	23.00	28.00
Cold stp.	22.00	22.50	28.50	36.50

Steel Plate

Pittsburgh	2.25c
New York, del.	2.54c
Philadelphia, del.	2.44½c
Boston, delivered	2.66c
Buffalo, delivered	2.49½c
Chicago or Gary	2.30c
Cleveland, del.	2.45½c
Birmingham	2.40c
Coatesville, base	2.35c
Sparrows Pt., base	2.35c
Pacific basing points, fo.b. cars	2.82½c
St. Louis, delivered	2.52c

Structural Shapes

Pittsburgh	2.25c
Philadelphia, del.	2.46½c
New York, del.	2.51¼c
Boston, delivered	2.64½c
Bethlehem	2.35c
Chicago	2.30c
Cleveland, del.	2.46c
Buffalo	2.35c
Gulf Ports	2.66c
Birmingham	2.40c
Pacific coast basing pts., f.o.b. cars	2.82½c
St. Louis, del.	2.52c

Bars

Soft Steel

(Base, 3 to 25 tons)

Pittsburgh	2.45c
Chicago or Gary	2.50c
Duluth	2.60c
Birmingham	2.60c
Cleveland	2.50c
Buffalo	2.55c
Detroit, delivered	2.60c
Pacific coast basing pts., f.o.b. cars	3.02½c
Philadelphia, del.	2.75c
Boston, delivered	2.86c
New York, del.	2.79c

Rail Steel

To Manufacturing Trade

Pittsburgh	2.30c
Chicago or Gary	2.35c
Cleveland	2.35c
Moline, Ill.	2.35c
Buffalo	2.40c
Birmingham	2.45c

Iron

Terre Haute, Ind.	2.35c
Chicago	2.40c
Philadelphia	2.64c
Pittsburgh, refined	3.50-8.00c

Reinforcing

New billet, straight lengths, quoted by distributors

Pittsburgh	2.45c
Chicago, Gary, Buffalo, Cleve., Birm., Young.	2.50c
Gulf ports	2.85c
Pacific coast ports, f.o.b. car docks	2.95c
Philadelphia, del.	2.75c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	2.30c
Chicago, Buffalo, Cleveland, Birm., Young.	2.35c
Gulf ports	2.80c

Wire Products

Prices apply to mixed carloads, base; less carloads subject to quantity extras.

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails	$2.75
Cement coated nails	$2.75

(Per pound)

Polished staples	3.45c
Galv. fence staples	3.70c
Barbed wire, galv.	3.40c
Annealed fence wire	3.15c
Galv. fence wire	3.55c
Woven wire fencing (base C. L. column)	74
Single loop bale ties, (base C. L. column)	63

To Manufacturing Trade

Plain wire, 6-9 ga.	2.90c
Galvanized wire	2.95c
Anderson, Ind. (merchant products only) and Chicago up $1; Duluth and Worcester up $2; Birmingham up $3.	
Spring wire, Pitts. or Cleveland	3.50c
Do., Chicago up $1, Worc. $2.	

Cold-Finished Carbon Bars, Shafting

Pittsburgh	2.90c
Chicago	2.95c
Gary, Ind.	2.95c
Detroit	2.95c
Cleveland	2.95c
Buffalo	3.00c

Subject to quantity deductions and extras. List dated Aug. 26, 1935; revised Oct. 1, 1936.

Alloy Steel Bars (Hot)

(*Base, 3 to 25 tons*)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem	3.00c

Alloy	Diff.	Alloy	Diff.
S.A.E.		S.A.E.	
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20
4100 0.15 to 0.25 Mo.			0.55
4600 0.20 to 0.30 Mo. 1.50-2.00 Ni.			1.10
5100 0.80-1.10 Cr.			0.45
5100 Cr. spring			0.15
6100 bars			1.20
6100 spring			0.85
Cr. N., Van.			1.50
Carbon Van.			0.85
9200 spring flats			0.15
9200 spring rounds, squares			0.40

Piling

Pittsburgh	2.60c
Chicago, Buffalo	2.70c

Strip and Hoops

(Base, hot-rolled, 25-1 ton)
(Base, cold-rolled, 25-3 tons)

Hot strip to 23⅛-in.	
Pittsburgh	2.40c
Chicago or Gary	2.50c
Birmingham base	2.55c
Detroit, del.	2.61c
Philadelphia, del.	2.70c
New York, del.	2.74c
Cooperage hoop,	
Pittsburgh	2.50c
Chicago	2.60c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland	3.20c
Detroit, del.	3.41c
Worcester, Mass.	3.40c

Carbon	Cleve. Pitts.	Worcester, Mass.
0.26—0.50	3.20c	4.30c
0.51—0.75	4.45c	4.65c
0.76—1.00	6.30c	6.50c
Over 1.00	8.50c	8.70c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$42.50
Relay rails, Pittsburgh 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pittsburgh, Chicago	$43.00
Do., rerolling quality	42.00
Angle bars, billet, Gary, Pittsburgh, So. Chicago	2.80c
Do., axle steel	2.35c
Spikes, R. R. base	3.15c
Track bolts, base	4.35c
Tie plate, base	$46.00

Base, light rails 25 to 60 lbs.; 20 lbs. up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists:

Carriage and Machine

½ x 6 and smaller	65-5 off
Do. larger, to 1-in.	60-10 off
Do. 1⅛ and 1¼-in.	60-5 off
Tire bolts	50 off

Plow Bolts

All sizes	65-5 off

Stove Bolts

In packages with nuts attached 70 off; in packages with nuts separate 70-10 off; in bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts	50-10-5 off
Elevator bolts	50-10-5 off

Nuts

S. A. E. semifinished hex.: ⅛ to ⅞-inch	60-10 off
Do., 9/16 to 1-inch	60-5 off
Do., over 1-inch	60 off

Hexagon Cap Screws

Milled	50-10 off
Upset, 1-in., smaller	60 off

Square Head Set Screws

Upset, 1-in., smaller	75 off
Headless set screws	75 off

Rivets, Wrought Washers

Structural, Pittsburgh, Cleveland	3.60c
Structural, Chicago	3.70c
⅞-inch and smaller, Pitts., Chi., Cleve.	65-5 off
Wrought washers, Pitts., Chi., Phila. to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75	off

Cut Nails

Cut nails, C. L. Pitts. (10% disc. on all extras)	$3.60
Do., less carloads, 5 kegs or more, no discount on any extras	$3.90
Do., under 5 kegs no disc. on any extras	$4.05

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts, Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago, del. 2½ less. Wrought pipe, Pittsburgh.

Butt Weld

Steel

In.	Blk.	Galv.
½	59½	49
¾	62½	53
1—3	64½	55½

Iron

¾	26	8
1—1¼	30	14
1½	34	16½
2	33½	16

Lap Weld

Steel

2	57	47½
2½—3	60	50½
3½—6	62	52½
7 and 8	61	50½
9 and 10	60½	50

Iron

2	26½	10
2½—3½	27½	12½
4	29½	16
4½—8	28½	15
9—12	24½	10

Line Pipe

Steel

1 to 3, butt weld	63½	
2, lap weld	56	
2½ to 3, lap weld	59	
3½ to 6, lap weld	61	
7 and 8, lap weld	60	
10-inch, lap weld	59½	
12-inch, lap weld	58½	

Butt Weld

Iron

	Blk.	Galv.
¾	25	7
1 and 1¼	29	13
1½	33	15½
2	32½	15

Lap Weld

1½	23½	7
2	25½	9
2½ to 3½	26½	11½
4	28½	15
4½ to 8	27½	14
9 to 12	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet, f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Weld

Sizes	Steel	Charcoal Iron
1½" OD x 13 Ga.	$10.45	$23.71
1¾" OD x 13 Ga.	11.89	22.93
2" OD x 13 Ga.	13.31	19.35
2" OD x 11 Ga.	15.49	23.36
2¼" OD x 13 Ga.	14.82	21.68
2¼" OD x 11 Ga.	17.38	26.02
2½" OD x 12 Ga.	17.82	26.57
2¾" OD x 12 Ga.	18.86	29.00
3" OD x 12 Ga.	19.73	31.36
3½" OD x 11 Ga.	24.89	39.81
4" OD x 10 Ga.	30.81	49.90
5" OD x 9 Ga.	47.57	73.93
6" OD x 7 Ga.	73.25	....

Seamless

	Hot Rolled	Cold Drawn
1" OD x 13 Ga.	$ 8.41	$ 9.46
1¼" OD x 13 Ga.	9.96	11.21
1½" OD x 13 Ga.	11.00	12.38
1¾" OD x 13 Ga.	12.51	14.09
2"OD x 13 Ga.	14.02	15.78
2¼" OD x 13 Ga.	15.63	17.60
2¼" OD x 12 Ga.	17.21	19.37
2½" OD x 12 Ga.	18.85	21.22
2¾" OD x 12 Ga.	19.98	22.49
3" OD x 12 Ga.	20.97	23.60
4½" OD x 10 Ga.	40.15	45.19
3½" OD x 11 Ga.	26.47	29.79
4" OD x 10 Ga.	32.83	36.94
5" OD x 9 Ga.	50.38	56.71
6" OD x 7 Ga.	77.35	87.07

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$46.00-47.00
4-in., Birmingham	49.00-50.00
4-in., Chicago	57.20-58.20
6 to 24-in., Chicago	54.20-55.20
6-in. & over, east fdy.	50.00
Do., 4-in.	53.00

Class A Pipe $3 over Class B
Stnd. fitgs., Birm., base $100.00

Semifinished Steel

Billets and Blooms

4 x 4-*inch base; gross ton*

Pitts., Chi., Cleve., Buffalo, Young., Birm.	$37.00
Philadelphia	42.30
Duluth	39.00

Forging Billets

6 x 6 *to* 9 x 9-*in., base*

Pitts., Chicago, Buffalo	43.00
Forging, Duluth	45.00

Sheet Bars

Pitts., Cleve., Young Sparrows Point	37.00

Slabs

Pitts., Chicago, Cleveland, Youngstown	37.00

Wire Rods

Pitts., Cleve., No. 5 to ⅜-inch incl.	47.00
Do., over ⅜ to 41/64-inch incl.	52.00

Chicago up $1; Worcester up $2.

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt.	2.10c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$4.00- 4.50
Connellsville, fdry.	5.00- 5.50
Connell. prem. fdry	5.75- 6.25
New River fdry.	6.50- 6.75
Wise county fdry.	5.75- 6.00
Wise county fur.	4.75- 5.00

By-Product Foundry

Newark, N. J., del.	10.88-11.35
Chi., ov., outside del.	10.25
Chicago, del.	11.00
Milwaukee, ovens	11.00
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.50
Indianapolis, del.	10.50
Cincinnati, del.	10.50
Cleveland, del.	11.05
Buffalo, del.	10.50
Detroit, del.	11.10
Philadelphia, del.	10.63

Coke By-Products

Spot, gal. Producers' Plants

Pure and 90% benzol	16.00c
Toluol	30.00c
Solvent naphtha	30.00c
Industrial xylol	30.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	16.25c
do. (450 lbs.)	15.25c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls. to jobbers	7.25c

Per ton, bulk, f.o.b. oven or port

Sulphate of ammonia	$29.50

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$25.00	$25.50	$23.50	$26.00
Birdsboro, Pa.	25.00	25.50	24.50	26.00
Birmingham, Ala.‡	20.38	.....	19.38	25.00
Buffalo	24.00	24.50	23.00	25.00
Chicago	24.00	24.00	23.50	24.50
Cleveland	24.00	24.00	23.50	24.50
Detroit	24.00	24.00	23.50	24.50
Duluth	24.50	24.50	.....	25.00
Erie, Pa.	24.00	24.50	23.50	25.00
Everett, Mass.	25.75	26.25	25.25	26.75
Granite City, Ill.	24.00	24.00	23.50	24.50
Hamilton, O.	24.00	24.00	23.50	.....
Neville Island, Pa.	24.00	24.00	23.50	24.50
Provo, Utah	22.00	.....	.....	.....
Sharpsville, Pa.	24.00	24.00	23.50	24.50
Sparrow's Point, Md.	25.00	.....	24.50	.....
Swedeland, Pa.	25.00	25.50	24.50	26.00
Toledo, O.	24.00	24.00	23.50	24.50
Youngstown, O.	24.00	24.00	23.50	24.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	25.39	25.39	24.89	25.89
Baltimore from Birmingham	25.78	.....	24.66	.....
Boston from Birmingham	26.57	.....	26.07	.....
Boston from Everett, Mass.	26.30	26.80	25.80	27.30
Boston from Buffalo	26.45	26.95	25.95	27.45
Brooklyn, N. Y., from Bethelehem	27.47	27.97	.....	.....
Brooklyn, N. Y., from Bmghm.	27.25	.....	.....	.....
Canton, O., from Cleveland	25.39	25.39	24.89	25.89
Chicago from Birmingham	24.42	.....	23.30	.....
Cincinnati from Hamilton, O.	24.27	25.11	24.61	.....
Cincinnati from Birmingham	23.89	.....	22.89	.....
Cleveland from Birmingham	24.32	.....	23.82	.....
Mansfield, O., from Toledo, O.	25.94	25.94	25.44	25.44
Milwaukee from Chicago	25.10	25.10	24.60	25.10
Muskegon, Mich., from Chicago, Toledo or Detroit	27.10	27.10	26.60	27.60
Newark, N. J., from Birmingham	26.21	.....	.....	.....
Newark, N. J., from Bethlehem	26.53	27.03	.....	.....
Philadelphia from Birmingham	25.58	.....	25.46	.....
Philadelphia from Swedeland, Pa.	25.84	26.34	25.34	.....
Pittsburgh district from Neville Island	Neville, base plus 63c, 76c, and $1.13 switch'g charges			
Saginaw, Mich., from Detroit	26.45	26.45	25.95	25.95
St. Louis, northern	24.55	24.55	24.05	.....
St. Louis from Birmingham	†24.12	.....	23.82	.....
St. Paul from Duluth	26.08	26.08	.....	26.58

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $28.50, Phil. base, standard and copper bearing, $29.63.

Gray Forge		Charcoal	
Valley furnace	$23.50	Lake Superior fur.	$27.00
Pitts. dist. fur.	23.50	do., del. Chicago	30.24
		Lyles, Tenn.	26.50

Silvery†

Jackson county, O., base: 6-6.50 per cent $28.50; 6.51-7—$29.00; 7-7.50—$29.50; 7.51-8—$30.00; 8-8.50—$30.50; 8.51-9—$31.00; 9-9.50—$31.50; Buffalo $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base: Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$64.60

First Quality

Pa., Ill., Md., Mo., Ky.	51.30
Alabama, Georgia	51.30
New Jersey	56.00

Second Quality

Pa., Ill., Ky., Md., Mo.	46.55
Georgia, Alabama	41.80
New Jersey	51.00

Ohio

First quality	43.70
Intermediate	39.90
Second quality	35.15

Malleable Bung Brick

All bases	$59.85

Silica Brick

Pennsylvania	$51.30
Joliet, E. Chicago	59.85
Birmingham, Ala.	51.30

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$30.00
Wire cut	$28.00

Magnesite

Imported dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags) $45.00

Domestic dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags) 43.00

Base Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$49.00
Chem. bonded chrome	49.00
Magnesite brick	69.00
Chem. bonded magnesite	59.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$23.50-24.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	$20.00
Do., for barge	$22.00
No. 2 lump	22.00-23.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82%, tidewater, duty pd.	$102.50
Do., Baltimore, base	102.50
Do., del. Pittsburgh	107.49
Spiegeleisen, 19-21% dom. Palmerton, Pa., spot	33.00
Do., New Orleans	33.00
Do., 26-28%, Palmerton	39.00
Ferrosilicon, 50% freight allowed, c.l.	69.50
Do., ton lot	80.50
Do., 75 per cent	126.00
Spot, $5 a ton higher.	
Silicoman., 2½ carbon	106.50
2% carbon 111.50; 1%,	121.50
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del.	10.50
Ferrotungsten, stand., lb. con. del. cars	1.95-2.00
Ferrovanadium, 35 to 40% lb., cont.	2.70-2.90
Ferrotitanium, c. l., prod-plant, frt. all., net ton	142.50
Contract, ton lots	145.00
Spot, ton lots	150.00
Ferrophosphorus, per ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage	58.50
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Monsanto, Tenn., 24% $3 unitage	75.00
Ferromolybdenum, stand. 55-65%, lb. f.o.b. mill	0.95
Molybdate, lb. cont. f.o.b. mill	0.80
Technical molybdenum trioxide, 53 to 60% molybdenum, f.o.b. mill	0.80

†Carloads. Quan. diff. apply.

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin, New York: Spot	Straits Tin, New York: Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony American Spot, N. Y.	Nickel Cathodes
Feb. 26	10.00	10.12½	9.52½	42.25	42.50	4.50	4.35	4.75	20.00	13.75	35.00
Feb. 28	10.00	10.12½	9.52½	42.12½	42.35	4.50	4.35	4.75	20.00	13.75	35.00
Mar. 1	10.00	10.12½	9.52½	41.75	42.20	4.50	4.35	4.75	20.00	13.75	35.00
Mar. 2	10.00	10.12½	9.52½	42.00	42.35	4.50	4.35	4.75	20.00	13.75	35.00
Mar. 3	10.00	10.12½	9.52½	41.75	42.10	4.50	4.35	4.75	20.00	13.75	35.00
Mar. 4	10.00	10.12½	9.52½	41.75	42.05	4.50	4.35	4.75	20.00	13.75	35.00

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 10.00c *Conn. copper*

Sheets

Yellow brass (high)	16.62½
Copper, hot rolled	18.12½
Lead, cut to jobbers	7.75
Zinc, 100-lb. base	10.00

Tubes

High, yellow brass	19.37½
Seamless copper	18.62½

Rods

High yellow brass	12.62½
Copper, hot rolled	14.62½

Anodes

Copper, untrimmed	15.37½

Wire

Yellow brass (high)	16.87½

OLD METALS

Nom. Del. buying prices

No. 1 Composition Red Brass

New York	5.95-6.10
*Cleveland	6.25-6.50
Chicago	5.50-5.75
*St. Louis	5.75-6.00

Heavy Copper and Wire

New York, No. 1	7.00-7.12½
Cleveland, No. 1	7.25-7.50
Chicago, No. 1	7.12½-7.37½
*St. Louis	7.25-7.50

Composition Brass Borings

New York	4.95-5.10

Light Copper

New York	5.00-5.12½
Cleveland	5.50-5.75
Chicago	5.25-5.50
*St. Louis	5.25-5.50

Light Brass

*Cleveland	3.00-3.25
Chicago	3.50-3.75
*St. Louis	3.50-3.75

Lead

New York	3.50-3.75
Cleveland	3.00-3.25
Chicago	3.00-3.25
St. Louis	3.25-3.50

Zinc

New York	2.12½-2.25
Cleveland	1.75-2.00
St. Louis	2.12½-2.37½

Aluminum

Borings, Cleveland	5.75-6.00
Mixed cast, Cleve.	8.75-9.00
Clips, soft, Cleve.	12.25-13.00
*Mixed cast, St. L.	8.50-8.75

SECONDARY METALS

Brass, ingot, 85-5-5-5, lcl.	10.25
Stand. No. 12 alum.	16.00-16.50

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-In. & Over	Structural Shapes	Floor Plates	Sheets Hot Rolled No. 10	Sheets Hot Roll Ann. No. 24	Sheets Galv. No. 24
Boston	4.20c	4.40c	5.40c	4.08c	4.07c	5.73c	4.15c	4.90c	5.10c
New York (Metropolitan)	4.12	4.32	4.32	4.00	3.97	5.60	4.07	4.50	5.00
Philadelphia	4.00	4.10	4.35	3.90	3.90	5.25	4.00	4.65	4.90
Baltimore	4.00	4.20	4.45	3.90	3.90	5.50	3.95	4.50	4.70
Norfolk, Va.	4.15	4.35	4.60	4.05	4.05	5.65	4.10	4.70	5.35
Buffalo	3.90	4.22	4.22	3.92	3.80	5.52	3.97	4.80	5.35
Pittsburgh	3.80	4.00	4.00	3.70	3.70	5.30	3.75	4.50	5.15
Cleveland	3.75	4.16	4.16	3.86	3.86	5.46	3.91	4.66	5.31
Detroit	3.935	4.185	4.185	3.95	3.95	5.55	3.935	4.685	5.40
Cincinnati	4.05	4.25	4.25	3.95	3.95	5.55	4.00	4.75	5.40
Chicago	3.85	4.10	4.10	3.75	3.75	5.35	3.85	4.60	5.25
Minneapolis	4.10	4.35	4.35	4.00	4.00	5.60	4.10	4.75	5.25
Milwaukee	3.96	4.21	4.21	3.86	3.86	5.46	3.96	4.71	5.36
St. Louis	4.09	4.34	4.34	3.99	3.99	5.59	4.09	4.84	5.49
Kansas City	4.34	4.59	4.59	4.24	4.24	5.84	4.10	4.85	5.50
Memphis	4.31	4.51	4.51	4.21	4.21	5.85	4.26	5.01	5.66
Chattanooga	4.21	4.41	4.41	4.11	4.11	5.91	4.16	4.06	4.66
Tulsa, Okla.	4.79	5.04	5.04	4.69	4.69	6.29	4.79	5.54	6.19
Birmingham, Ala.	3.85	4.05	4.05	3.75	3.75	5.96	3.80	4.55	5.20
New Orleans	4.10	4.65	4.65	4.00	4.00	5.95	4.25	4.75	5.15
Houston, Tex.	3.75	6.00	6.40	3.95	3.95	6.00	4.50	5.25	5.65
Seattle	4.45	4.95	6.30	4.25	4.25	6.00	4.50	5.35	5.90
Portland, Oreg.	4.45	4.95	6.30	4.25	4.25	6.00	4.50	5.15	5.90
Los Angeles	4.30	4.80	6.55	4.30	4.30	6.20	4.50	5.00	5.25
San Francisco	4.20	4.80	6.50	4.05	4.05	5.55	4.30	5.15	5.55

	Cold Rolled Strip	Cold Finished Bars	SAE Hot-rolled Bars (Unannealed) 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series	SAE Cold Drawn Bars 2300	SAE Cold Drawn Bars 3100
Boston	3.845c	4.65c	4.50c	7.97c	6.52c	6.27c	8.37c	8.97c	7.52c
New York	3.92	4.57	4.32	7.82	6.37	6.12	....	9.00	7.55
Philadelphia	3.88	4.53	4.25	....	....	....	....	....	....
Baltimore	....	4.50	4.15	....	....	....	....	....	....
Norfolk, Va.	....	4.60	....	....	....	....	....	....	....
Buffalo	3.79	4.35	4.10	7.60	6.15	5.90	8.00	8.60	8.15
Pittsburgh	....	4.15	3.95	7.70	6.25	8.50	9.10	8.70	7.25
Cleveland	3.60	4.30	3.95	7.78	6.33	6.33	8.18	8.60	7.15
Detroit	3.78	4.30	4.085	7.89	6.44	6.19	7.74	8.88	7.43
Cincinnati	....	4.50	4.07	7.91	6.46	6.21	9.31	8.92	7.47
Chicago	3.87	4.30	4.05	7.60	6.15	5.90	8.00	8.60	7.15
Minneapolis	....	4.77	4.25	7.95	6.50	8.97	9.57	9.17	7.72
Milwaukee	....	4.41	4.16	7.81	6.36	6.11	8.21	8.81	7.36
St. Louis	3.96	4.54	4.29	7.94	6.49	6.24	8.34	8.94	7.49
Kansas City	4.37	4.79	....	....	....	....	....	....	....
Memphis	....	4.80	....	....	....	....	....	....	....
Chattanooga	....	4.86	....	....	....	....	....	....	....
Tulsa, Okla.	....	5.24	....	....	....	....	....	....	....
New Orleans	5.00	5.10	....	....	....	....	....	....	....
Seattle	....	5.85	6.05	....	8.00	8.00	8.65	....	....
Portland, Oreg.	....	5.85	5.85	9.00	8.00	7.85	8.70	....	....
Los Angeles	5.96	6.85	4.65	9.40	8.55	8.40	9.05	10.40	9.55
San Francisco	9.30	6.80	5.20	9.65	8.80	8.65	9.30	10.65	9.80

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, March 3

Export Prices f. o. b. Port of Dispatch—

By Cable or Radio

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons: Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
Foundry, 2.50-3.00 Si.	$28.87 5 15 0	$18.02	2 5 0
Basic bessemer	....	17.82	2 4 6
Hematite, Phos. .03-.05	32.63 6 10 0*	.....	.....
Billets	$39.61 7 17 6	$43.01	5 7 6
Wire rods, No. 5 gage	56.71 11 5 6	42.00	5 5 0
Standard rails	$50.93 10 2 6	$46.00	5 15 0
Merchant bars	2.64c 11 15 0	1.81c	5 0 0
Structural shapes	2.39c 10 12 6	1.76c	4 17 6
Plates, †¼ in. or 5 mm.	2.60c 11 11 3	2.22c	6 2 6
Sheets, black, 24 gage or 0.5 mm.	3.15c 14 0 0	2.81c	7 15 0°
Sheets, gal., 24 ga., corr.	3.77c 16 15 0	3.44c	9 10 0
Bands and strips	2.98c 13 5 0	1.91c to 1.99c	5 5 0 to 5 10 0
Plain wire, base	4.39c 19 10 0	2.22c to 2.63c	6 2 6 to 7 5 0
Galvanized wire, base	5.23c 23 5 0	2.84c to 2.94c	7 17 6 to 8 2 6
Wire nails, base	4.16c 18 10 0	2.53c to 2.71c	7 0 0 to 7 10 0
Tin plate, box 108 lbs.	$5.66 1 2 6	....	.....

British ferromanganese $102.50 delivered Atlantic seaboard, duty-paid

Domestic Prices at Works or Furnace—

Last Reported

	£ s d	French Francs		Belgian Francs		Reich Marks	
Fdy. pig iron, Si. 2.5	$27.41 5 9 0(a)	$18.33	563½	$22.10	650	$25.50	63
Basic bess. pig iron	25.15 5 0 0(a)	.....	...	.....	...	28.13(b)	69.50
Furnace coke	8.16 1 12 6	6.18	189	7.31	215	7.69	19
Billets	39.71 7 17 6	27.46	840	32.64	960	39.06	96.50
Standard rails	2.28c 10 2 6	1.73c	1,150	2.06c	1,375	2.38c	132
Merchant bars	2.58c 11 9 0	1.62c	1,080	1.65c	1,100	1.98c	110
Structural shapes	2.48c 11 0 6	1.58c	1,055	1.65c	1,100	1.93c	107
Plates, †¼-in. or 5 mm.	2.64c 11 14 3	2.03c	1,350	2.06c	1,375	2.29c	127
Sheets, black	3.53c 15 15 0§	2.35c	1,565‡	2.36c	1,575‡	2.59c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	4.16c 18 10 0	3.38c	2,250	4.50c	3,000	6.66c	370
Plain wire	4.39c 19 10 0	2.49c	1,660	2.48c	1,650	3.11c	173
Bands and strips	2.75c 12 4 0	1.82c	1,210	2.32c	1,550	2.29c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. (a) del. Middlesbrough. (b) hematite. °Close annealed.

**Gold pound sterling carries a premium of 64.4 per cent over paper sterling.

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates brokers prices

HEAVY MELTING STEEL

Birmingham, No. 1	10.00
Birmingham, No. 2	9.00
Bos. dock No. 1 exp.	14.00
N. Eng. del. No. 1	13.50
Buffalo, No. 1	12.50-13.00
Buffalo, No. 2	10.50-11.00
Chicago, No. 1	11.75-12.25
Cleveland, No. 1	11.50-12.00
Cleveland, No. 2	10.50-11.00
Detroit, No. 1	9.00- 9.50
Eastern Pa., No. 1	14.00-14.50
Eastern Pa., No. 2	12.50-13.00
Federal, Ill.	10.75-11.25
Granite City, R. R.	12.50
Granite City, No. 2	11.00-11.50
Los Angeles, No. 1	15.00-17.50
Los Angeles, No. 2	13.50-16.00
New York, No. 1	†11.00
N. Y. dock No. 1 exp.	12.50
Pitts., No. 1 (R. R.)	15.50-16.00
Pitts., No. 1 (dlr.)	13.50-14.00
Pittsburgh, No. 2	12.50-13.00
St. Louis, R. R.	12.00-12.50
St. Louis, No. 2	11.00-11.50
San Francisco, No. 1	14.00-15.00
Seattle, No. 1	8.00
Toronto, dlrs. No. 1	10.00
Valleys, No. 1	13.50-14.00

COMPRESSED SHEETS

Buffalo, dealers	10.50-12.00
Chicago, factory	10.75-11.25
Chicago, dealer	9.75-10.25
Cleveland	11.00-11.50
Detroit	10.25-10.75
E. Pa., new mat.	14.50
E. Pa., old mat.	9.50-10.00
Los Angeles	14.50-16.50
Pittsburgh	13.00-13.50
St. Louis	6.75- 7.25
Valleys	13.25-13.50

BUNDLED SHEETS

Buffalo	11.50
Cincinnati, del.	9.00- 9.50
Cleveland	8.00- 8.50
Los Angeles	11.50-14.50
Pittsburgh	12.50-13.00
St. Louis	6.00- 6.50
Toronto, dealers	7.00

SHEET CLIPPINGS, LOOSE

Chicago	7.00- 7.50
Cincinnati	5.50- 6.00
Detroit	7.00- 7.50
† Los Angeles	4.00
St. Louis	5.00- 5.50

STEEL RAILS, SHORT

Birmingham	15.00
Buffalo	17.50-18.00
Chicago (3 ft.)	15.00-15.50
Chicago (2 ft.)	15.50-16.00
Cincinnati, del.	17.00-17.50
Detroit	14.50-15.00
Los Angeles	18.00-22.00
Pitts, 3 ft. and less	17.75-18.25
St. Louis, 2 ft. & less	15.00-15.50

STEEL RAILS, SCRAP

Boston district	†11.00
Buffalo	15.50-16.00
Chicago	11.75-12.25
Cleveland	16.00-16.50
Pittsburgh	15.75-16.25
St. Louis	12.00-12.50
Seattle	10.00

STOVE PLATE

Birmingham	8.00- 8.50
Boston, district	†8.25- 8.50
Buffalo	10.50-11.00
Chicago, net	8.50- 9.00
Cincinnati, dealers	6.50- 7.00
Detroit, net	7.50- 8.00
Eastern Pa.	12.50-13.00
New York, fdry.	†8.50- 9.00
St. Louis	8.00- 8.50
Toronto, deal'rs, net	9.00

SPRINGS

Buffalo	16.00-16.50
Chicago, coil	16.50-17.00
Chicago, leaf	15.00-15.50
Eastern Pa.	17.00-17.50
Pittsburgh	17.75-18.25
St. Louis	14.00-14.50

ANGLE BARS—STEEL

Chicago	14.00-14.50
St. Louis	13.00-13.50

RAILROAD SPECIALTIES

Chicago	14.00-14.50

LOW PHOSPHORUS

Buffalo, crops	17.00-17.50
Cleveland, crops	19.50-20.50
Eastern Pa., crops	18.50-19.00
Pittsburgh, crops	17.50-18.50

FROGS, SWITCHES

Chicago	12.00-12.50
St. Louis, cut	12.00-12.50

SHOVELING STEEL

Federal, Ill.	10.75-11.25
Granite City, Ill.	11.00-11.50
Los Angeles (net)	16.00-18.00
Toronto, dealers	8.00

RAILROAD WROUGHT

Birmingham	11.00-11.50
Boston district	†9.00- 9.50
Chicago, No. 1 net	9.50-10.00
Cincinnati, No. 2	9.50-10.00
Eastern Pa., No. 1	15.50-16.00
St. Louis, No. 1	8.50- 9.00
St. Louis, No. 2	12.00-12.50
Toronto, No. 1 dlr.	16.00

SPECIFICATION PIPE

Eastern Pa.	14.00-14.50
New York	†9.00- 9.50

BUSHELING

Buffalo, No. 1	10.50-11.00
Chicago, No. 1	10.50-11.00
Cincin., No. 1, deal.	8.50- 9.00
Cincinnati, No. 2	3.00- 3.50
Cleveland, No. 2	7.50- 8.00
Detroit, No. 1, new	9.00- 9.50
Valleys, new, No. 1	12.50-13.00
Toronto, dealers	7.00

MACHINE TURNINGS

Birmingham	6.00- 7.00
Buffalo	6.25- 6.75
Chicago	6.00- 6.50
Cincinnati, dealers	4.00- 4.50
Cleveland	6.50- 7.00
Detroit	5.00- 5.50
Eastern Pa.	7.00- 7.50
Los Angeles	4.00- 8.00
New York	†4.50
Pittsburgh	8.00- 8.50
St. Louis	4.50- 5.00
Toronto, dealers	7.00
Valleys	9.50-10.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	†2.50
Buffalo	6.50- 7.00
Cincinnati, dealers	3.50- 4.00
Cleveland	7.50- 8.00
Detroit	5.00- 5.50
Eastern Pa.	6.50- 7.00
New York	†4.50- 5.00
Pittsburgh	7.00- 7.50
Toronto, dealers	7.50

CAST IRON BORINGS

Birmingham	6.00- 7.00
Boston dist. chem.	†7.50- 8.00
Bos. dist. for mills	†7.00- 7.50
Buffalo	6.50- 7.00
Chicago	5.50- 6.00
Cincinnati, dealers	3.50- 4.00
Cleveland	7.50- 8.00
Detroit	5.00- 5.50
E. Pa., chemical	12.00-13.00
New York	†4.50- 5.00
St. Louis	5.00- 5.50
Toronto, dealers	7.50

PIPE AND FLUES

Cincinnati, dealers	7.00- 7.50
Chicago, net	7.50- 8.00

RAILROAD GRATE BARS

Buffalo	9.00- 9.50
Chicago, net	8.50- 9.00
Cincinnati	6.00- 6.50
Eastern Pa.	12.50-13.00
New York	†8.50- 9.00
St. Louis	9.00- 9.50

FORGE FLASHINGS

Boston district	†7.00
Buffalo	10.50-11.00
Cleveland	11.00- 11.50
Detroit	8.50- 9.00
Los Angeles	9.00
Pittsburgh	12.75-13.25

FORGE SCRAP

Boston district	†6.50
Chicago, heavy	15.00-15.50

ARCH BARS, TRANSOMS

St. Louis	14.00-14.50

AXLE TURNINGS

Boston district	†7.50
Buffalo	12.00-12.50
Chicago, elec. fur.	11.50-12.00
Eastern Pa.	12.50-13.00
St. Louis	8.00- 8.50
Toronto	8.00

STEEL CAR AXLES

Birmingham	16.00-17.00
Buffalo	16.00-16.50
Boston district	†14.00
Chicago, net	17.00-17.50
Eastern Pa.	21.00-21.50
St. Louis	17.50-18.00

SHAFTING

Boston district	†14.00
New York	†15.50-16.00
Eastern Pa.	19.00-19.50
St. Louis	13.00-13.50

CAR WHEELS

Birmingham	14.00-15.00
Boston dist., iron	†10.00
Buffalo, steel	16.00-16.50
Chicago, iron	14.00-14.50
Chicago, rolled steel	14.50-15.00
Cincinnati, iron	15.00-15.50
Eastern Pa., iron	15.50
Eastern Pa., steel	17.00-17.50
Pittsburgh, iron	15.00-15.50
Pittsburgh, steel	17.75-18.25
St. Louis, iron	12.00-12.50
St. Louis, steel	14.50-15.00

NO. 1 CAST SCRAP

Birmingham	14.00-14.50
Boston, No. 1 mach.	†11.00
N. Eng. del. No. 2	12.00
N. Eng. del. textile	15.00-15.50
Buffalo, cupola	13.50-14.00
Buffalo, mach.	15.00-15.50
Chicago, agri. net	10.50-11.00
Chicago, auto	11.50-12.00
Chicago, railr'd net	10.50-11.00
Chicago, mach. net	11.50-12.00
Cincin., mach. cup.	11.00-11.50
Cleveland, mach.	17.00-17.50
Eastern Pa., cupola	15.50-16.00
E. Pa., mixed yard	13.50-14.00
Los Angeles	13.00-14.00
Pittsburgh cupola	16.00-16.50
San Francisco, del.	13.50-14.00
Seattle	8.00
St. Louis, No. 1	10.00-10.50
St. L., No. 1, mach.	11.00-11.50
Toronto, No. 1, mach., net	12.50

HEAVY CAST

Boston dist. break.	†9.00- 9.50
N. Eng., del.	11.50-12.00
Buffalo, break	11.00-11.50
Cleveland, break.	14.00-15.00
Detroit, break.	10.00-10.50
Detroit, auto net	12.50-13.00
Eastern Pa.	14.00-14.50
Los Angeles	13.00-14.00
New York, break.	†10.50-11.00
Pittsburgh	12.50-13.00

MALLEABLE

Birmingham, R. R.	12.50-13.50
New England, del.	16.00
Buffalo	13.50-14.00
Chicago, R. R.	14.00-14.50
Cincin., agri. del.	10.50-11.00
Cleveland, rail	15.50-16.00
Detroit, auto	11.50-12.00
Eastern Pa., R. R.	15.50-16.00
Los Angeles	13.00-14.00
Pittsburgh, rail	14.25-14.75
St. Louis, R. R.	13.00-13.50

RAILS FOR ROLLING

5 feet and over

Birmingham	16.00-17.00
Boston	†12.00
Chicago	15.00-15.50
Eastern Pa.	18.00-18.50
New York	†15.00-15.50
St. Louis	13.50-14.00

LOCOMOTIVE TIRES

Chicago (cut)	14.50-15.00
St. Louis, No. 1	13.75-14.25

LOW PHOS. PUNCHINGS

Buffalo	16.00-16.50
Chicago	14.00-14.50
Eastern Pa.	18.00-19.00
Pitts. (lt. & hvy.)	17.00-18.00
Seattle	15.00

Iron Ore

Lake Superior Ore

Gross ton, 51½ % Lower Lake Ports

Old range bessemer	$5.25
Mesabi nonbess.	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbess.	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-10.00
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, f.a.s. Atlantic

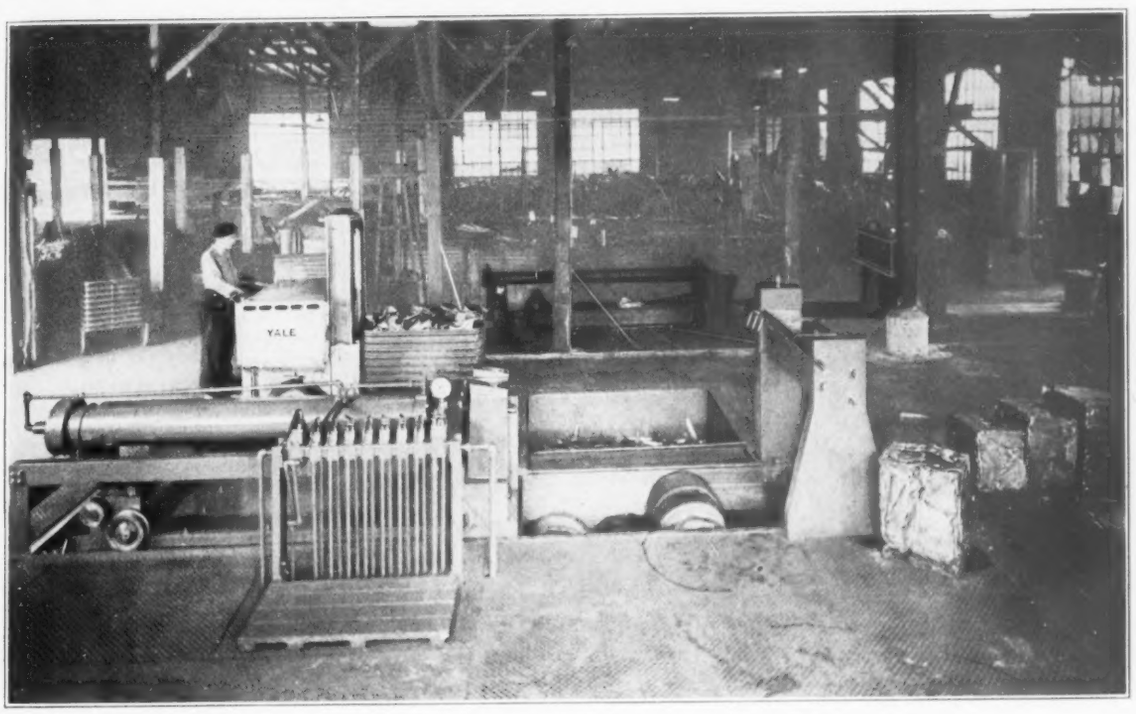
Foreign manganiferous ore, 45.55% iron, 6-10% man. nom.	12.00-13.00
No. Afr. low phos.	nominal
Swedish low phos.	17.00-18.00
Spanish No. Africa basic, 50 to 60% nom.	12.00
Tungsten, sh. ton unit, duty paid nom.	24.50-25.50
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$25.50-26.50
Molybdenum ores sulphide, per lb. molybdenum contained, f.o.b. mill	0.75

Manganese Ore

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52%	non. 45.00
So. African, 50-52%	nom. 45.00
Indian, 50-52%	Nominal

LOGEMANN
Scrap Balers



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LOGEMANN scrap metal presses are obtainable in various sizes and types. Ask for circulars.

Please state character of scrap, daily tonnage and range of gauges, when writing.

LOGEMANN BROTHERS CO.
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Sheets

Sheet Prices, Page 94

Pittsburgh — Sheet production for the district has shown a slight increase over the past week and figures for February indicate a somewhat better tonnage than in January. March is expected to continue at about the same rate, with probably a slight betterment over February. Sheet producers do not look for any appreciable increase until the automotive situation is cleared up. Galvanized sheet production continues to rise slowly, although tonnages are not much better than previously reported.

Cleveland—Specifications continue to show the improvement reported in the closing days of last month, but the aggregate increase is below expectations. Consumer stocks with but a few exceptions are said to be substantially reduced. This is reflected in the character of recent orders requesting immediate deliveries. In some instances mills have been unable to meet the prompt delivery requirements due to the irregular rolling schedules. Most sellers confidently expect at least a moderate improvement in March.

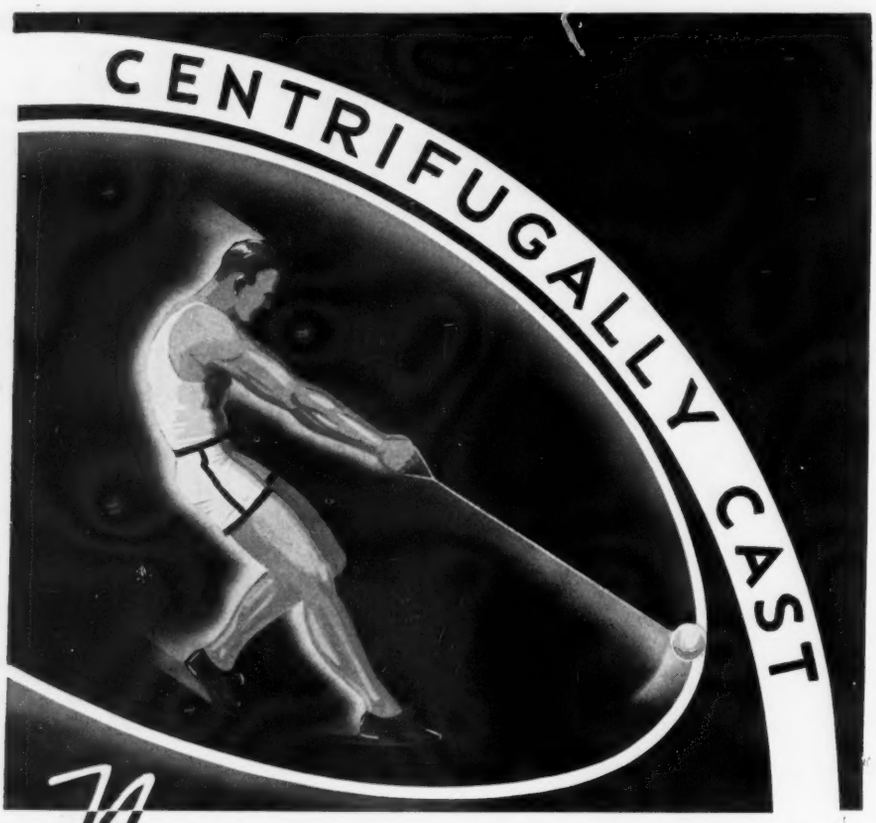
Chicago—Sheet sales show occasional gains, improvement in all cases being moderate and generally representing early needs. Automotive demand is slow to expand, but is counted on for improvement later this month. Farm equipment manufacturers are taking steady shipments, while betterment in orders from miscellaneous users frequently results from depletion of inventories. Sheet deliveries range up to three weeks for hot-rolled annealed and galvanized material.

Boston—Gains in sheet buying have been slight, jobbers releasing little tonnage. Small tank fabricators are unusually inactive and stamping and others industrial consumers are buying small lots as needed. Car lot orders are few, although a western Massachusetts oil pump manufacturer recently placed close to 500 tons, mostly sheets.

New York—While spotty, demand for sheets made some gain last week. Some sellers report no improvement whatever, while others indicate an increase. One large district office reports the best business of the year, with volume increased by two rather substantial orders. Enameled stock appears in growing demand by manufacturers of stoves and electric refrigerators, who are anticipating some new life as a result of the government's proposed housing program.

Philadelphia—An auto body maker reports an initial release for about 1700 units for a new low-priced model. Additional releases are expected regularly, the volume depending on retail automobile sales. About 1000 tons of cold-rolled auto body sheets also were bought recently by another auto maker. Continued comparative inactivity of the auto trade is indicated by the fact one plant is averaging only about two days a week and a second around four. The radio trade continues slow but a little more business is coming out from refrigerator, cabinet and air conditioning equipment makers. A decided gain also is noted in galvanized sheets for building work. Tin plate is slow, stocks in hands of canmakers averaging two to five months, most of which was bought before the last price advance.

Buffalo—The manner in which buyers have been withholding purchases leads mills to believe a better demand for sheets will be witnessed in March. Inventories in many instances are said to be at a point where consumers will be forced to replenish stocks. Orders are still for immediate shipments. Current



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SHENANGO-PENN MOLD COMPANY

***Plant*, Dover, Ohio**

Executive Offices: Oliver Bldg., Pittsburgh *

inquiry is principally from stamping shops with automotive orders negligible.

Cincinnati—Current sheet ordering is moderately lower than the best levels in February, chiefly because of shrinkage in export demand. Jobbers' specifications have been well maintained, and galvanized is active. Considering the season, small tonnage is provided by manufacturers of automobiles and household equipment, with mills anxiously awaiting the expected upturn. Breadth of demand is a bright feature.

St. Louis—The general sheet situation has held the improvement noted in the past three or four weeks. Small consumers have come into the market since reaffirmation of prices into second quarter, and inquiries from larger users are also somewhat more numerous. The general feeling is that consumer inventories are light.

Birmingham, Ala. — Sheets continue to hold the slight gain evident several weeks ago with manufacturers' sheets still slightly more in demand than other specifications.

Strip

Strip Prices, Page 95

Pittsburgh — Strip production for last week showed a small increase in both hot and cold-rolled, but tonnages are far from satisfactory. The average is still substantially below most other finished steel products. Production for the month of February showed a small increase over January, but March is not expected to be much better.

Cleveland—Sellers of hot and cold-rolled strip report a slight improvement in new business. Most believe that stocks of many consumers are so low that renewed buying based on present operations has become necessary. This is felt to be one of the most important features of the present market and many feel that once consumers begin to experience increased sales, a substantial improvement in buying of steel is bound to follow.

Chicago — Improvement in strip demand still is small, and business is only moderately above the lowest level for the year to date. Heavier shipments to the automotive industry are looked for later this month, but the outlook for better business elsewhere still is somewhat uncertain. Small lots predominate in new business.

Boston — Orders for narrow cold-rolled strip are slightly more numerous, but are still small individually with prompt shipment requested. While consumer stocks of steel are low, users appear anxious to lower their stocks of finished goods before building up new supplies of steel. This situation is clearly reflected in buying, which is irregular and varying from day to day. Hot strip demand is dull.

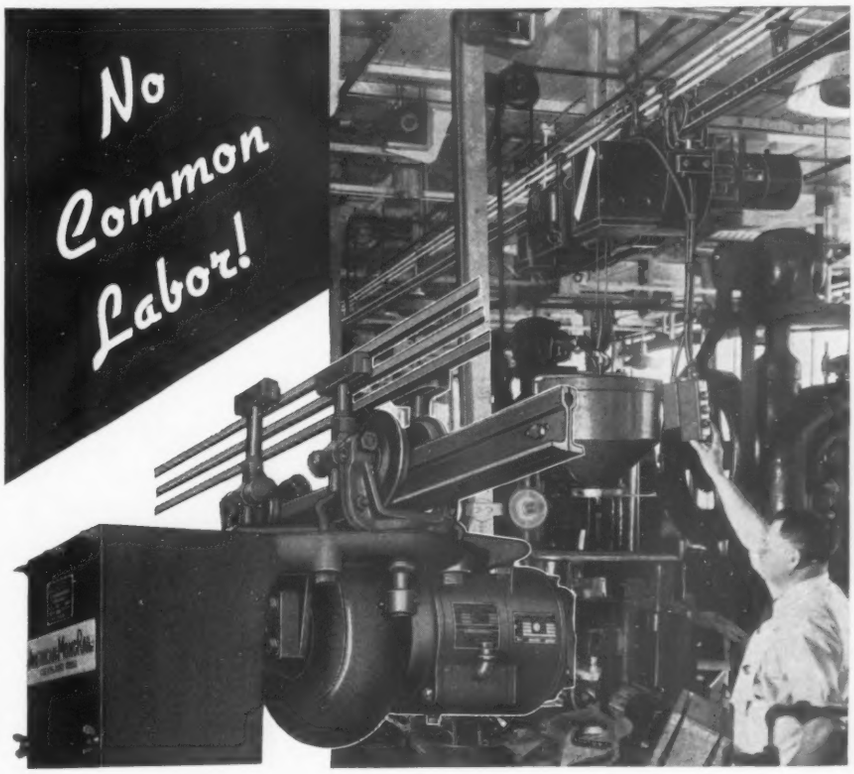
New York—A moderate improvement in strip buying is due to a slight gain in the number of scattered orders, which continue small. Consumers are releasing shipments in small lots and working it off without building up supplies. This applies to both narrow cold-rolled and hot material. Operations in eastern plants are unchanged.

Philadelphia—Narrow strip sellers report receipt of some business of a spotty character, not being well distributed among the usual outlets. In general, however, there is a continuance of mild improvement registered in February. Prices on most incoming business are steady.

Semifinished

Semifinished Prices, Page 95

Orders for semifinished steel in February were about the same as



. . . and no lost machine time. Slugs of semi-precious metal are delivered from a central control point by this automatic carrier. The skilled operator merely signals for metal and, when it arrives, unloads the carrier and returns it by push-button switch. Wise management gets full benefit from his skilled wage.

This is but one of the many systems designed by American MonoRail engineers for eliminating needless handling costs. Both manual and power operated carriers show labor saving returns.

A copy of 24 page book describing the MonoTractor drive is available. Write to the American Mono-Rail Co., 13102 Athens Avenue, Cleveland, Ohio.

in the preceding month, and orders over the past week are on practically the same basis, with some slight increase in demand for skelp. It is still evident that buyers are supplying only absolute needs for orders now on hand and no change in this condition is expected.

Plates

Plate Prices, Page 94

Pittsburgh—The plate market continues dull with no immediate prospects for large business. Action is contemplated soon on some barge contracts, which will increase the tonnage now being rolled, but structural and building awards are still light.

Cleveland—Producers of wide and narrow plates note little change in current requirements. With railroads definitely out of the market until the rate question is settled and the volume of structural requirements at the present low level, little real improvement can be expected. Miscellaneous ship repair work is going along steadily, but this tonnage is already covered. Finishing mill operations continue irregular.

Chicago—Plate buying still is retarded by light requirements of railroads. Building construction is slow to increase though inquiries lately have involved larger lots of plates. While a small gain is noted in plate demand for freight car repairs, only a small amount of business is in prospect for new equipment building during the next 30 days. Tank work remains moderately active.

Boston—Plates have been purchased for construction of 50 passenger coaches recently placed by the New York, New Haven & Hartford railroad, to be built at Worcester. Railroads, however, are buying sparingly. Except for a 1200-ton gas-holder for the Connecticut Light & Power Co., Waterbury, Conn., specific work is slack. United Engineers & Constructors, Philadelphia, will place the material for this project. Shipyard releases are steady. Boiler and structural shops are placing little tonnage.

The navy has awarded 3625 tons of plates, sheets, strip and shapes, mostly the former, for four destroyers, half being Boston delivery and the remainder for Charleston, S. C., and Puget Sound, Wash. Central Iron & Steel Co., Harrisburg, Pa., taking most of the plate tonnage, 2010 tons, practically all for the Boston navy yard. Worth Steel Co., Claymont, Del., booked 210 tons, Alan Wood Steel Co., Conshohocken, Pa., 327 tons, Lukens Steel Co., Coatesville, Pa., 258 tons, Thomas Gregory Galvanizing Co., New York, 310 tons, Jones & Laughlin Steel Corp., Pittsburgh, 130 tons and Carnegie-Illinois Steel Corp., Pittsburgh, 180 tons.

Philadelphia—Plates probably are showing less improvement than most lines. Considerable ship tonnage on jobs already awarded to district yards remains to be placed, however, and rumors are current that at least two oil companies are quietly seeking tenders on several additional tankers. Shipbuilders were in Washington last week discussing prices bid Feb. 1 on 12 cargo vessels for the maritime commission. The plate trade expects definite action shortly which will result in placing of these vessels with east coast yards. The railroads, pending the freight rate decision, provide little plate tonnage. A few bright spots exist, however. It is reported considerable business is pending for turbine construction and a fair tonnage of plates is currently going into miscellaneous oil line jobs. Tank work is slow. Most sales are at published prices.

Steel & Alloy Tank Co., Newark,

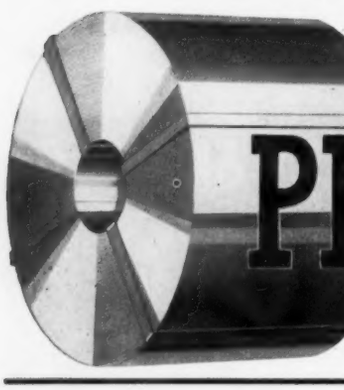
SPECIFY C·M·P ACCURACY

● When the engineer or designer plans for precision strip steel, he wants uniform close accuracy to gauge over the complete width and length of the strip. Instead of specifying a special tolerance today, more and more manufacturers get just this quality at no extra cost by ordering "C.M.P. Accuracy."

Cold Rolled Precision Strip Steel produced on our 4-high single stand reversing mills is held to exceptionally close limits. You are assured of uniform production, coil after coil. It is continuously annealed in a single thickness in controlled atmosphere, assuring a bright, uniform anneal from edge to edge.

"C.M.P. Accuracy" applies to all grades of strip in carbon and stainless grades, in gauges as light as .001" and in coils as large as you can handle.

The Cold Metal Process Co.
YOUNGSTOWN, OHIO



Cold Rolled PRECISION STRIP STEEL

N. J., has been awarded a contract at $43,500 by the United States engineer at Wilmington, Del., for 40 steel catamarans.

United States maritime commission has accepted the bid of the Tampa Shipbuilding & Engineering Co., Tampa, Fla., for construction of four diesel type, single screw, steel cargo vessels of the commission's standard C-2 design. The Tampa firm bid $1,815,663 each, a total of $7,262,652 for the group. No action was taken with respect to bids for the remaining eight vessels on which tenders were originally invited.

Seattle—Shell Oil Co. plans construction of two storage tanks at its Spokane plant, involving 100 tons or more. H. C. Hanson, Seattle, naval architect, is about to place contracts for three light river tank barges, requiring 65 tons of plates and shapes.

Plate Contracts Placed

670 tons, 18 tanks, Texas Co., Fort Netches, Tex., to Petroleum Iron Works Co., Sharon, Pa.

620 tons, penstocks, lower Colorado river, to Chicago Bridge & Iron Co., Chicago.

Plate Contracts Pending

100 tons or more, two 25,000-gallon storage tanks for Shell Oil Co., Spokane, Wash.

Unstated tonnage, 20 open hopper barges and 217 barge hopper covers, bids opened Feb. 21 by Inland Waterways Corp., New Orleans; Ingalls Iron Works, Birmingham, Ala., apparently low bidder.

Bars

Bar Prices, Page 94

Pittsburgh — A somewhat better tone has been noted in bars since the beginning of March, although most orders now being received are for fill-in and do not represent any substantial upturn. Major users of bars are still fairly well stocked and tonnage for this month will probably be only slightly better than for February.

Cleveland — Users of commercial and alloy steel bars continue to specify for actual requirements and for prompt delivery. Railroad buying is almost at a standstill and auto builders and parts suppliers have not shown signs of emerging from the restricted operations of the past 60 days. Producers look to farm implement manufacturers to carry them through the present dull market.

Chicago — A moderate gain in steel bar demand from farm equipment manufacturers and miscellaneous consumers offsets the continued lag in automotive buying. Some increase in needs of motor car interests is looked for within the next several weeks in view of anticipated expansion in assemblies.

New York—Commercial bar business tends slightly upward. Volume is still limited, however. Most sellers look for gradual improvement throughout the month, with automotive buyers likely to increase their requirements. Jobbers also are showing somewhat more interest and in the cold-drawn lines, machine tool builders are still taking a fair amount, notwithstanding a continued decline in their own bookings.

Boston — Most industrial consumers of commercial steel and alloy bars have small supplies, but are long on stocks of finished fabricated material. This is especially true of some bolt and nut producers. Buying is light with cold finished bars making the best showing, according to several sellers, although textile machinery builders, normally the best consumers in this district, are not active as a rule. Forging shop demand is steady, but in small volume.

Philadelphia—Merchant bars continue to show the slight improvement of the past several weeks although admittedly of modest pro-

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Behind the Scenes with STEEL

Serious Note

■ Steel rate for this week, as you may have noticed, is lurking around 30 per cent of capacity. But let's take a real peep Behind The Scenes With STEEL and peer a bit into the fog of the future. Experts (meaning sales executives of several of the larger steel producers) agree the national steel rate for March will touch between 35 and 40 per cent. More happily, they predict a rate of 45 to 50 per cent in May and a high of 60 per cent or more in the fall months—and they expect the 1938 average to be 50 per cent. Of course this is a bit less than the 72.3 for 1937, but then it's a nice bit more than the 30 we're looking at now.

Note on Organ

■ It begins to look like we aren't the only ones who go for the new departmental headings now appearing in these pages. In fact, just the other day Meldrum & Fewsmith Inc. of Cleveland asked if we had any possible objections to similar heads being used in the *Service Reporter*, Chrysler Motors service division house organ which M & F has been surveying to recommend improvements. We object not. And that noise you hear is our Skipper being flattered.

High Figh-nance

■ This week we bow in humility to the Readers' Service Department. Last week, you recall, we heckled their new Helpful Literature page at its debut. So the boys down there formed a pool, wherein one could, by a two-bit honorarium, float a guess as to how many pieces of the literature in question would be requested. Always the sourpuss, we turned in the lowest guess. Well, there're three more days to go and right now our guess is lagging some 1004 places behind the actual returns. And the jackpot has been conceded to the man who guessed highest of all. Dawgonnit, and just the other day we bet the Industrial Equipment editor that Cleveland's Terminal Tower (right outside our window) wasn't one of the twenty tallest buildings in the country, let alone the tallest one in the country outside N'Yawk.

Interoffice Intrigue

■ The Tool Engineers are holding their first convention in Detroit this week and STEEL will be there, booth and all. Russ Jaenke and Chuck Schmidt are going up (or out, or over) from the home office and will be working on the scene night and day. This is by way of a rest to the Schmidt, who has been laboring under the deluge of Helpful Lit cards all week. Russ, by the way, is the one who won the— hey wait a minute! It was Schmidt who collected that pool money, and Russ who won it. Let's see—and now they're both on a nice little trip to Detroit. Oh, well, maybe it's just a coincidence.

Culinary Contactor

■ And speaking of organs, we couldn't help but notice the Feb. issue of *The Contactor* newly launched publication of Clark Controller Co. Browsing between the covers we found different things than the stale jokes and incessant advt. blurbs that are in most house organs. Ah yes, *The Contactor* included an excellent photo illustration to Lowell's "The First Snowfall," two noteworthy editorials along with an enclosure of Industry's Platform for 1938, an article on Cleveland's new Arena with photos showing some neat leg art, and (take it easy) one full page entirely devoted to the art of making waffles. Yep, a recipe and everything.

—SHRDLU

portions. Early decision on the freight increase is expected to bring out considerable railroad tonnage for routine requirements. In the meantime, the roads are shifting material to avoid new commitments. Other outlets, mostly miscellaneous in character, provide most current bar tonnage. Prices remain firm.

Pipe

Pipe Prices, Page 95

Pittsburgh — Orders for pipe and tubular goods for February held at about the same rate as January. Producers hope spring will bring a better volume for large size tubing in several pipe lines being contemplated.

Cleveland—Cast iron pipe foundry operating schedules remain substantially unchanged at one or two days a week. James B. Clow & Son Co., Cleveland, recently booked 140 tons for a new water distribution system at Jeffersonville, O., and a similar project for Upper Arlington, O., involving 100 tons. Bids are due soon on 100 tons for a water extension at Bucyrus, O. Most foundries are shipping from stock. Prices are firm.

Boston—Cast pipe buying has improved with more cities and towns covering for estimated requirements for the balance of the year. A good part is going to the district foundry, including the Medford, Mass. order, while a contractor placed close to 500 tons with the Burlington, N. J. foundry. Merchant steel pipe demand is steady and, while the volume is not large, this material is making a better showing than most steel products with prices well maintain.

New York—On most of 360 tons of cast pipe for Albany, awarded to United States Pipe & Foundry Co., Burlington, N. J., $53.25 net, delivered, was the price, applying on material 6 to 12 inches in diameter. Four-inch brought $56.25. Special castings were awarded the same foundry at $109 a net ton. The total award included 447 tons. Buying is mostly confined to small lots with inquiry lagging behind the usual seasonal trend.

The local procurement division has postponed to March 8 opening of bids on about 200 tons of 12-inch steel pipe for piling.

Seattle—Tonnages pending are larger than for several months, most important being 1200 tons of 20-inch and under for a Seattle cross-town extension, Puget Sound Machinery Depot, general contractor.

Seattle—Cast iron extension on Queen Anne hill, to cost $14,000 is

planned. Montesano, Wash., has a WPA grant for a system extension. Tacoma has authorized a $5000 improvement.

Birmingham, Ala.—Some brightening of the picture in the pipe industry is indicated by reports of additional inquiries following a fairly satisfactory month in February when considerable tonnage moved in carload lots. The district's plants generally are still on a three-day basis.

Cast Pipe Placed

1675 tons, 6 to 16-inch water mains, Milwaukee, to United States Pipe & Foundry Co., Burlington, N. J.

500 tons, 6 to 10-inch, Colchester, Conn., to United States Pipe & Foundry Co., Burlington, N. J., through N. Benvenuti & Sons, New London, Conn., contractor.

450 tons, 6-inch, Shrewsbury, Mass., to Warren Pipe & Foundry Co., Everett, Mass.

100 tons or more, remainder of 1938 requirements, Medford, Mass., to Warren Pipe & Foundry Co., Everett, Mass.

Unstated tonnage, 2190 feet, 24-inch cast iron culvert pipe, state procurement officer, treasury department, Elmira, N. Y., to Gould Pumps, Inc., Seneca Falls, N. Y.; bids Feb. 24, proposal 30046.

Cast Pipe Pending

150 tons, 4, 6 and 8-inch, Twisp, Wash.; G. M. Payne, Omak, Wash., low.

Unstated tonnage, 6500 feet of 4 to 8-inch class 250 pipe, Appleton, Wis.; bids March 1.

Unstated tonnage, 10,000 feet, various sizes, Trempealeau, Wis.; bids about March 10.

Wire

Wire Prices, Page 95

Pittsburgh — Orders and inquiries for wire and wire products are still holding up fairly well. February volume was substantially over that of January with the greatest volume coming in the closing part of the month. No decrease has appeared as yet and producers believe March will show an increase over February. Finished product inventories among manufacturers are gradually being depleted and it is believed this will be reflected in wire orders shortly. Merchant wire is still more active than manufacturers' products, however.

Cleveland—Producers report new business has increased steadily at a moderate rate over the past week to ten days. Jobbers and dealers are more inclined to bolster stocks and otherwise fill in certain sizes since prices were announced unchanged for second quarter. Requirements for manufacturing wire have shown little change from the low levels of 30 days ago, but demand for merchant wire products from agricultural centers has shown moderate improvement.

Chicago — Steel wire sales show only slight change. Demand for merchant wire products is expected to improve this month in view of the low level of distributors' stocks and the favorable situation in cash farm income. Anticipated gains in automotive buying of manufacturers' wire have yet to develop, and business from miscellaneous users is confined to small lots and represents prompt needs.

Boston — While there has been some scattered improvement in demand for a few specialties, wire buying continues light without much change in the operating rate, which in few instances is beyond 30 per cent of finishing capacity. The failure of the automobile industry to release anything like its normal volume is keenly felt. A fair number of orders for prompt shipment are being booked, but the aggregate volume is light. Nail prices are weak, notably among secondary sellers.

New York—Wire orders are slightly more numerous, but as a rule are

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small, for prompt delivery. While the reaffirming of prices on wire products has resulted in release of some tonnage, the volume has been small, but slightly broader. There has been a mild improvement in demand from screw machine product makers. Wire rod inquiry continues slack.

Birmingham, Ala. — Demand for wire is unchanged from last week and is described as generally satisfactory, although in less volume than had been generally anticipated.

Rails, Cars

Track Material Prices, Page 95

Placing of 30,000 tons of rails for March and April delivery with Chicago mills indicates the carriers are in need of track material and cannot hold back until the rate decision is announced. Names of the buyers are not revealed. With traffic at the present low level pressure for rolling stock is not insistent.

Interborough Rapid Transit Co., New York, will open bids March 22 on 50 subway cars, to be constructed of high tensile steel. A lot of five to ten tank cars is pending and nine such cars have been placed in the past few days.

Domestic purchases of cars in February totaled 109, making a total of 134 for the two months of 1938. Details are shown in the following table:

	1938	1937	1936	1935
Jan.	25	17,806	2,050	24
Feb.	109	4,972	6,900	806
2 mos.	134	22,778	8,950	830
March		8,155	632	0
April		9,772	4,427	350
May		4,732	8,900	2
June		548	5,200	5,151
July		1,030	7,229	500
Aug.		1,475	225	200
Sept.		1,216	1,750	875
Oct.		1,355	2,210	1,250
Nov.		275	1,550	100
Dec.		275	23,450	10,050
Total		51,611	64,643	19,308

Car Orders Placed

Canfield Tank line, four tank cars, to General American Transportation Corp., Chicago.

Niagara Smelting Corp., one tank car, to General American Transportation Corp.

Shell Chemical Co., four tank cars, to General American Transportation Corp., Chicago.

Car Orders Pending

Interboro Rapid Transit Co., New York, 50 subway cars, bids to be closed March 22.

United Fruit Co., Boston, 5 to 10 tank cars, bids asked.

Shapes

Structural Shape Prices, Page 94

New York—Estimates are being taken on 10,770 tons for re-advertised contracts covering tunnels and shafts, board of water supply, New York. While somewhat heavier, structural inquiry has improved less than expected for this season. The bulk of new work is public character, although an encouraging volume of small apartment and housing requirements are appearing.

Pittsburgh—Demand is on the same basis as in the past few weeks, with a slight increase noted. This is not enough, however, to indicate a definite trend and merely reflects the up and down fluctuations of the past month.

Cleveland—Structural steel market has failed to register the moderate improvement expected since prices were announced unchanged for second quarter. Lack of confidence is the key to the present low volume of inquiries and awards. Companies with plans already prepared are holding back waiting for more definite signs of improved business conditions. Mill prices are firm, but fabricated prices have failed to stiffen.

Chicago—Structural inquiries are more numerous, particularly those jobs involving less than 100 tons. Among the larger pending tonnages trash rack material work for the Grand Coulee dam, involving 6000 tons, is outstanding. Awards are light, recent bookings involving lots of less than 500 tons.

Philadelphia — Structural awards totaled approximately 2000 tons, most of which involved lettings in conjunction with the Pennsylvania institutional program. Several additional jobs also have been placed for which the steel is yet to be purchased by general contractors. Largest project still before contractors is Mt. Gretna prison, which is expected to take considerable tonnage of both shapes and concrete bars. A little more private

Shape Awards Compared

	Tons
Week ended March 5	**9,403**
Week ended Feb. 26	**8,409**
Week ended Feb. 19	**12,814**
This week, 1937	**17,597**
Weekly average, year, 1937	**16,060**
Weekly average, 1938	**13,039**
Weekly average, February	**10,059**
Total to date, 1937	**264,490**
Total to date, 1938	**130,386**

Includes awards of 100 tons or more.

work is coming out, but considerable hesitancy still is shown.

Boston—Structural steel requirements are slowly mounting with about 5000 tons active in this district. New inquiry includes a machine shop, 1500 tons, for the Boston elevated railroad at Everett, Mass. Awards approximate 1000 tons, including a 600-ton high school, Rochester, placed by the Rugo Construction Co., Boston.

Buffalo—Activity is a shade better. Although few large tonnage jobs are pending the outlook for fabrication is brightened by reports that more than fifteen rural schools will be built in upper New York state soon. R. C. Mahon Co. Inc., Detroit, was awarded the contract for 300 tons for the building addition to the Curtiss-Aeroplane division plant of the Curtiss-Wright Corp.

Seattle—Bids are in for the Washington-Idaho interstate bridge involving 1075 tons of shapes and machinery and 500 tons of H piling. Tacoma, Wash., has awarded a contract for cranes and hoists for the water department to American Machinery & Electric Co. Tonnages pending are of small proportions.

Shape Contracts Placed

952 tons, hospital building, Warren, Pa., to Fort Pitt Bridge Works, Massillon division; through Lundoff-Bicknell Co., Cleveland, general contractors.

925 tons, for wickets on Ohio river dams, tonnage including shapes, cast steel and forgings, to American Car & Foundry Co., New York, on bids taken by U. S. engineers, Louisville, Ky.

925 tons, power house and spillway bridge, American Gas & Electric Service Corp., Radford, Va., to Virginia Bridge & Iron Co., Roanoke, Va.

815 tons, state hospital, Scranton, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

570 tons, transmission towers, Public Service Co., Streator, Ill., to Aermotor Co., Chicago.

440 tons, high school, Ft. Wayne, Ind., to Joseph T. Ryerson & Son Inc., Chicago.

430 tons, refinery, Nederland, Tex., divided as follows: 245 tons, Beaird Corp., Shreveport, La. and 185 tons, Mosher Steel Co., Dallas, Tex.; through Lummus Co., New York, general contractor.

375 tons, teacher's college, Mansfield, Pa., to Rogers Structural Steel Co., Corry, Pa.

300 tons, building addition Curtiss Aeroplane division of Curtiss-Wright Corp., Tonawanda, N. Y., to R. C. Mahon Co. Inc., Detroit; Darin & Armstrong, Detroit, general contractor.

275 tons, teacher's college, East Stroudsbourg, Pa., to Belmont Iron Works, Philadelphia.

260 tons, coal trestle for Ottawa street power station, Lansing, Mich., to Jarvis Engineering Works, Lansing, Mich.

255 tons, Wilson Canyon bridge, Arizona, to Minneapolis-Moline Power Implement Co., Minneapolis, Minn.; Lewis Bros., Phoenix, Ariz., general contractors. Allison Steel Mfg. Co., Phoenix, awarded 46 tons, reinforcing bars.

215 tons, theater, Auburn, N. Y., to Belmont Iron Works, Philadelphia.

200 tons, building, Kokomo Pottery Co., Delphi, Ind., to Hugh J. Baker Co., Indianapolis.

200 tons, viaduct crossing, Ebenezer, N. Y., for Pennsylvania railroad, Bero Engineering Co., Tonawanda, N. Y., low bidder.

190 tons, part two, Norristown State hospital, Norristown, Pa., to Phoenix Iron Co., Philadelphia.

185 tons, bridge, Mount Pulaski, Ill., to Missouri Bridge & Iron Co., St. Louis.

165 tons, experimental station, E. I. du Pont de Nemours & Co., Wilmington, Del., to Belmont Iron Works, Philadelphia.

160 tons, beams, subway construction, Huntington avenue extension, Boston, to Bethlehem Steel Co., Bethlehem, Pa., bids Feb. 28.

150 tons, building, Clark University, Worcester, Mass., to United Structural Steel Co., Worcester; L. Rochefort & Sons, Worcester, general contractor.

150 tons, repairs to bridge 388, Chicago, Rock Island & Pacific railroad, Ponca City, Okla., to J. B. Klein Iron & Foundry Co., Oklahoma City, Okla.

150 tons, state bridge 1609, Cannelton, Ind., to Central States Bridge & Steel Co., Indianapolis, Ind.

150 tons, building, Winthrop college, Rock Hill, S. C., to Southern Engineering Co., Charlotte, N. C.; through J. J. McDevitt Co., Charlotte, N. C.

148 tons, 12 and 14-foot sections, interlocking steel sheet piling, U. S. engineer, Providence, R. I., to Inland Steel Co., Chicago, 2.99c, less ½ of one per cent, 10 days; bids Feb. 24.

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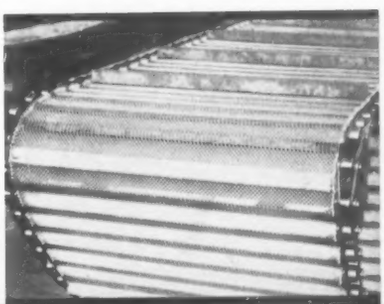

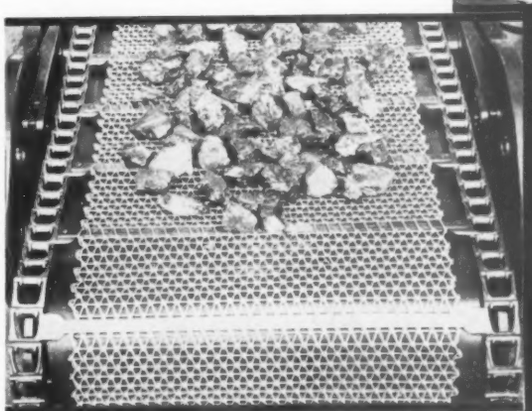

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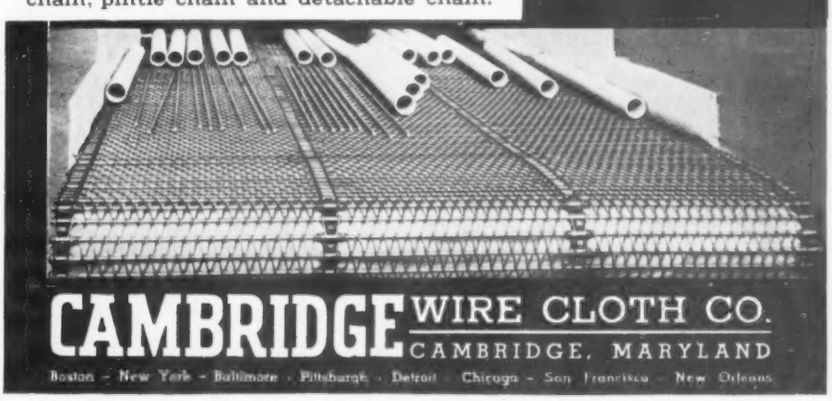
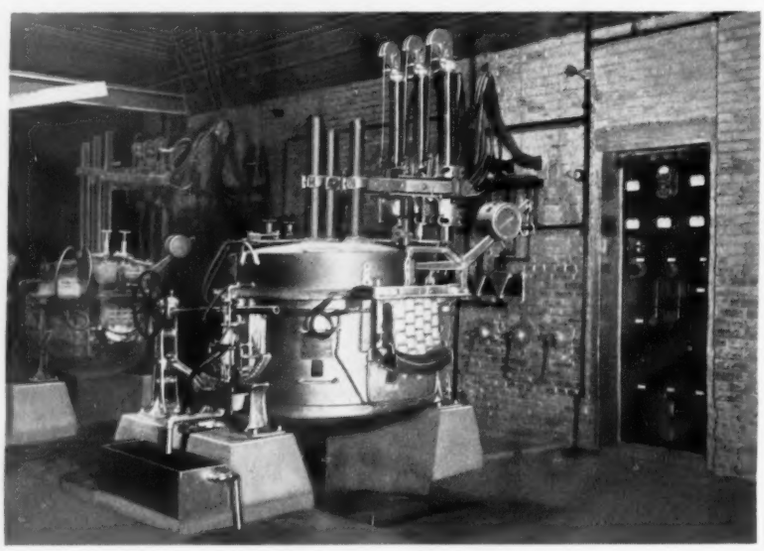


CAMBRIDGE WIRE CLOTH CO.
CAMBRIDGE, MARYLAND
Boston - New York - Baltimore - Pittsburgh - Detroit - Chicago - San Francisco - New Orleans

140 tons, bridge, Columbia, Ill., to Wendnagel & Co., Chicago.
130 tons, building, Eastern state penitentiary, Gratersford, Pa., to Bethlehem Steel Co., Bethlehem, Pa.
125 tons, school, Belmont, Mass., to A. O. Wilson Structural Co., Cambridge, Mass.; Matthew Cummings Co., Boston, general contractor.
123 tons, shapes and bars, three bridges, Osceloa county, Florida, to Bethlehem Steel Co., Bethlehem, Pa., and Virginia Steel Co., Richmond, Va.; Ryan Construction Co., Tampa, Fla., general contractor.
100 tons, rural school, Belfast, N. Y., Leo Ludwig & Son, Falconer, N. Y., low bidder.
100 tons, turn-table, including equipment, Bangor & Aroostook railroad, Bangor, Me., to Bethlehem Steel Co., Bethlehem, Pa.
100 tons, U. S. engineers' project, Louisville, Ky., to Duffin Iron Co., Chicago. Unstated reinforcing steel on same project to Colonial Supply Co., Louisville, Ky.

Shape Contracts Pending

4000 tons, steel sheet piling, private project, Miami, Fla.
1500 tons, machine and engine shop, Boston Elevated railroad, Everett, Mass.
1120 tons, northerly unit, Flushing river bridge, New York; L. P. O'Connor Inc., New York, low.
1075 tons, including machinery, interstate bridge Clarkston, Wash.; bids in at Olympia.
750 tons, contract MHT-72, New Jersey approach Lincoln tunnel, New York; bids March 29, port of New York authority.
500 tons, eight bridges, state of Wisconsin; bids March 4.
600 tons, reservoir, Duluth.
500 tons, shapes and bars, Littauer public administration school, Harvard University, Cambridge, Mass.; Aberthaw Co., Boston, general contractor.
500 tons, wing of memorial building, University of Wisconsin, Madison, Wis.; bids March 18.
500 tons, state cancer hospital, Buffalo; plans revised, bids March 31.
400 tons, highway bridge, McCormick, S. C.
400 tons, high school building, Ames, Iowa.
320 tons, highway bridge, East St. Louis, Ill.
300 tons, office building addition, Houston, Tex.
300 tons, building, Washington National Insurance Co., Evanston, Ill.
300 tons, Washington Heights health center, New York.
280 tons, highway bridge, Greenfield, Ill.
275 tons, hangar, Bolling field, Washington.
223 tons, highway bridge, Sylvania, Ga.
215 tons, hospital, Danville, Pa., Irwin & Leighton, Philadelphia, low.
203 tons, draft tubes and gate guides, Centerville, Ala.
200 tons, alterations to building, Lincoln Savings bank, New York.
200 tons, building, state hospital, Grafton, Mass.; Rugo Construction Co., Boston, general contractor.
200 tons, radial gates and bridges, Central Nebraska power and irrigation district, Hastings, Neb.
170 tons, fiber pilot plant, E. I. du Pont de Nemours & Co., Newbridge, Del.
110 tons, overpass, 120-foot through truss, Barnet, Vt.; M. DeGroot, Jericho, Vt., low, bids Feb. 25, Montpelier.
109 tons, shapes and bars, repairs, bridge, Shetucket river, Norwich-Sprague, Conn.; bids March 7, Hartford.
100 tons, shapes and bars, highway project, including H-beam bridge, Middletown, Conn.; bids March 7, Hartford.
Unstated tonnage, trashracks for outlet works, penstocks, etc., Coule project; bids to reclamation bureau, Denver, March 16.
Unstated tonnage, ring seal gates and conduit linings, Coulee project and Seminoe dam, Wyo.; bids to reclamation bureau, Denver, March 31.



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Reinforcing

Reinforcing Bar Prices, Page 95

New York—Reinforcing steel buying is slightly more active, contractors in several instances covering on requirements pending for several weeks. Mesh for highway construction is also coming out in better volume, although still below normal for this period.

Pittsburgh—Demand for reinforcing steel is still light, with a slight diminishing in inquiries and orders noted. There is still a fair amount of tonnage pending. In spite of pressure, prices have held and no weakening is anticipated at this point.

Cleveland — Reinforcing bars in Northern Ohio from private sources on which estimates were requested totaled only 55 tons during February, compared with 209 tons in January. Estimated tonnage of joists was 121 tons in February against 177 tons during January. Awards are limited to miscellaneous small tonnages well under 100 tons. However, bids for the Main street bridge Cleveland, should be out within the next few weeks. Fabricated prices remain weak, although no real test has recently been offered.

Chicago—Fair activity continues in small lot purchases of concrete bars. Pending business includes several large lots, but recent purchases and inquiries have been small. State highway work is fair-

Concrete Bars Compared

	Tons
Week ended March 5	2,640
Week ended Feb. 26	4,410
Week ended Feb. 19	4,920
This week, 1937	7,947
Weekly average, year, 1937	6,266
Weekly average, 1938	5,268
Weekly average, February	5,208
Total to date, 1937	38,060
Total to date, 1938	52,675

Includes awards of 100 tons or more.

ly promising, but only moderate lots are in prospect for public works financed by federal funds.

Boston—More highway work is appearing for estimates and including bridges such work accounts for approximately 800 tons, the bulk of the needs being for Connecticut and New Hampshire. Awards have not yet reflected better inquiry.

Philadelphia—Fabricators are evidencing considerable interest in the state sanitarium job at Mt. Alto, which will take approximately 1500 tons of reinforcing bars. Several other state jobs are current, with a few private alteration and addition projects. Recent work, mostly public, has been sufficient to book several fabricators two or three months ahead, but this will mean few steel purchases, since inventories already were adequate.

Seattle—Immediate prospects are not promising and rolling mill operations are at a minimum. Business pending is unimportant and no new projects of large size have developed. Washington state opened bids March 1 for highway projects and the interstate bridge at Clarkston, involving a total of 850 tons of concrete bars.

Reinforcing Steel Awards

625 tons, bridge, Hancock, Md., to Bethlehem Steel Co., Bethlehem, Pa.; through Dick Smith Engineering Co., Hazelton, Pa.

625 tons, ramps and approaches, Bronx-Whitestone bridge, New York, to Fireproof Products Co., New York; through Corbetta Construction Co., New York.

275 tons, Littauer public administration building, Harvard University, Cambridge, Mass., to Concrete Steel Co., New York; through Abertaw Co., Boston, general contractor.

275 tons, state hospital, Norristown, Pa., to Ceco Steel Products, Omaha, Nebr.

200 tons, state village, part 2, Laurelton, Pa., to Milton Mfg. Co., Milton, Pa.

200 tons, state hospital, Wernersville, Pa., to American Steel Engineering Co., Philadelphia.

180 tons, hospital, Pennhurst, Pa., to American Steel Engineering Co., Philadelphia.

150 tons, postoffice, Canal street, New York, to Capital Steel Co., New York; through George T. Atwell Co., New York, subcontractor.

110 tons, Spaulding high school, Rochester, N. H., to Northern Steel Co., Boston; through Hugo Construction Co., Boston.

Reinforcing Steel Pending

5000 tons, Possum-Kingdom dam, Brazos river, near Mineral Springs, Tex.; bids taken on alternate plans; Sheffield Steel Corp., Kansas City, Mo., low on new billet bars; Texas Steel Co., Fort Worth, Tex., low on straight rail bars; and Laclede Steel Co., St. Louis, low on bent rail bars.

1150 tons, Back river sewage disposal plant, Baltimore.

850 tons, interstate bridge and Washington highway projects; bids in at Olympia, Wash.

370 tons, northerly unit, Flushing river bridge, New York; L. P. O'Connor Inc., New York, low.

300 tons, junior high school, Cynwyd, Pa.

190 tons, telephone building, Springfield, Ill.

175 tons, eight bridges, state of Wisconsin; bids March 4.

150 tons, bars, state cancer hospital, Buffalo; plans revised, bids March 31.

135 tons, mesh and bars, state highway project, Concord, Boscawen and Franklin, N. H.; New Haven Road Construction Co., New Haven, Conn., low, $145,629.39, bids Feb. 24. Earle C. Hayden, Barre, Vt., low on concrete arch bridge, Haverhill, N. H., taking 45 tons.

125 tons, mesh, highway project, east approach to Connecticut river bridge, Portland, Conn.; bids March 7, Hartford.

125 tons, high school, Ames, Iowa.

125 tons, armory, Urbana, Ill.

125 tons, armory, Champaign, Ill.

100 tons, powerhouse, Missouri State penitentiary; all previous bids were rejected and new bids will be asked for March 29.

Cold Finished

Cold Finished Prices, Page 95

Pittsburgh—Cold-finished markets here remain unchanged, with few releases and practically no new inquiries. Farm machinery continues to supply the demand for tonnage which is now being booked. Automotive sources are still quiet.

Pig Iron

Pig Iron Prices, Page 96

Pittsburgh — The pig iron market in the Pittsburgh district is still quiet with no change from last week. Carload releases are still appearing occasionally, but mostly for orders now on the books, and it is evident that stocks generally are not being built up. Prices are firm, with no indication of change.

Cleveland—Pig iron producers report fourth quarter contracts are now practically cleared up, and that new orders have picked up somewhat, reflecting the change in buying methods of some consumers in specifying for more than actual requirements. February generally held on a par with January. It is believed that March should prove about 10 per cent better than February.

Chicago — While pig iron demand is slightly heavier, shipments are only moderately ahead of the lowest rate of the past three months. Foun-

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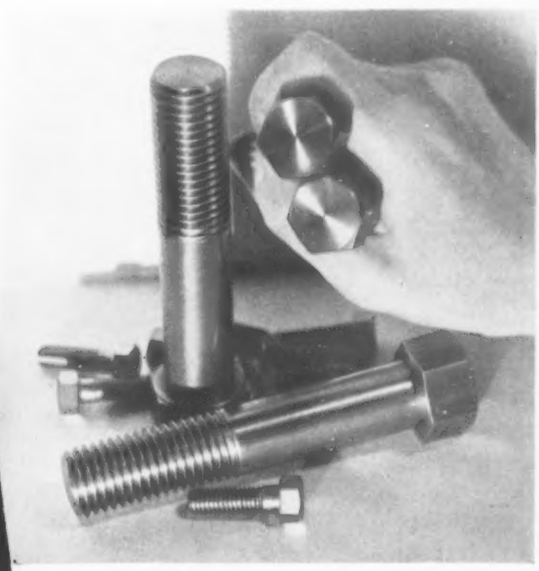

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dries in some instances still are working off inventories, and what new business is being received is for early requirements. Foundry operations show little change, most revisions being for the better. Prices are steady at $24 furnace for No. 2 foundry and malleable.

Boston — A slight flurry in pig iron buying for second quarter delivery has followed the reaffirming of prices for that period. While hardly normal, it is estimated that better than 1500 tons has been booked by various sellers, mostly in lots of 200 tons or less. Most of the covering has been by the smaller consumers with low stocks in a position to do so. The larger melters are still drawing on stocks without replacement buying.

New York — Most pig iron sellers anticipate some increase this month, particularly if higher freight rates are announced shortly for possible application around April 1. An increase in rates, it is pointed out, would undoubtedly result in a certain amount of protective buying. Meanwhile, business continues on a hand-to-mouth basis.

According to London advices here, an application has been made to the English Import Duties Advisory committee for removal from the free list and the imposition of additional duties on all grades of pig iron, excepting charcoal iron, vanadium-titanium iron and iron smelted in electric furnaces. The change if granted, would cover practically all iron exported to Great Britain from this country.

Philadelphia—Pig iron sellers report receipt of a few orders for single carlots. Consumers continue to operate with extremely low reserves in most instances. Prices are firm.

According to statistics just released by the department of commerce, 115 tons of pig iron were imported at Philadelphia during January from the Netherlands with a declared value of $25,149, approximately $20 a ton. During the same period, 2484 tons of Indian iron valued at $42,292 or $17.40 a ton also were brought in. Total imports of Dutch iron at all points in the United States were 4160 tons, valued at $89,701. The Indian iron tonnage was 5491 with a value of $92,571. Based on preliminary reports, February imports at Philadelphia were 100 tons of Dutch iron and 519 of Indian. January pig iron exports through the Philadelphia customs district totaled 892 tons to Japan and 25 tons each to Belgium and France.

Buffalo — Pig iron shipments are holding at a slightly improved level. Consumers refuse to build up reserves despite low inventories. Foundry reports vary but show an average of three days a week. There is little indication of orders being placed to beat an anticipated rise in freight rates. Daily shipments for February were about on par with January.

Cincinnati—Shipments so far this month resemble the February pattern. No improvement is seen in the foundry melt; demand for machine tool castings tends to skid. A late February flurry in specifications for Southern iron, attributed to exhausted inventories, has subsided. Buying is in carlots and may not revive for 30 to 60 days when many contracts will have been fulfilled. Reaffirming of prices caused no market effect excepting to bolster foundry confidence.

St. Louis—The pig iron situation has improved to the extent that specifications are much freer and generally inventories of consumers are considerably reduced. Buying, however, has not broadened to any appreciable extent, and is confined to lots from single cars to a maximum of 200 tons. Preliminary reports indicate that shipments in February exceeded those of January by a fair margin despite the smaller number of days. The total, however, was measurably below a year ago.

According to producers and distributors the reaffirmation of prices into the second quarter has had no effect one way or the other on the market, the news having been pretty well discounted.

Birmingham, Ala. — Pig iron continues on a basis of 13 furnaces in production and with indication of a revival in buying. Melters still are asking shipment on business already booked.

Scrap

Scrap Prices, Page 98

Philadelphia—Steelmaking grades of scrap are being maintained by continuance of export demand. About 20,000 tons of material will move overseas from this immediate area during March. It is anticipated that this tonnage will just about complete old export orders at higher prices and the market subsequently may sag considerably unless the domestic market offers support. No. 1 steel is in relatively greater demand for export than No. 2 and consequently is proportionately stronger. No. 1 material is available at no less than $14.50 for export, while No. 2 may be had at $13. In the domestic market, one mill with a favorable freight rate has purchased No. 1 material at $14 although $14.50 continues to apply in other directions. A user of No.

2 steel has dropped its price to $12 but is getting little at this level. One broker with a domestic contract for No. 1 steel has revised his buying price 50 cents to $14. Several miscellaneous grades are easier, including cast scrap.

Pittsburgh — Continued quiet in the scrap market locally has halted the temporary weakness in heavy melting steel. Lack of demand in most specialties is noticeable. Possibility of further weakness in railroad steel is seen as a result of a curtailment of export buying and railroad lists closing this week are being watched for some indication of what will happen in domestic markets.

Cleveland — Buying of iron and steel scrap currently is confined to occasional carloads, picked up at bargain prices or for fill-in purposes. Larger consumers do not appear interested as they have large supplies in most cases. Open-hearth operations in this immediate district still are greatly restricted. Foundries, however, are in the market occasionally for cast grades.

Trade interest at the moment centers around railroad offerings in lists now closing. Altogether tonnages are not heavy.

Chicago — Scrap is quiet in the consumers' market despite a slight increase in mill operations. Prices are steadied by the restricted tonnages of old material being offered, and bids on recent railroad lists have been well above the nominal mill market. Heavy melting steel on railroad offerings has brought around $12.80, though $12 is the common figure on transactions between brokers and dealers. This grade nominally may be called $11.75 to $12.25 in the consumers' market.

Boston — Scrap demand has slowed materially, with export buying less active, brokers having covered well in advance. The volume of scrap to be shipped from this district against the last purchase by the European cartel is materially lower, in fact shippers are approaching the end of this tonnage. Demand is at a standstill, steelworks and foundry grades being equally dull, with prices nominal.

New York—Following purchase of 80,000 tons of steelmaking scrap by Italy outside the cartel most exporting brokers here have lowered bids on heavy melting steel $1 to $12.50 for No. 1 and $11.50 for No. 2, with No. 2 cast for export also lower at $10.50, barge. The purchase by Italy was largely heavy melting steel and the price is reported $1.50 under that paid by the cartel. Little tonnage remains to be shipped on the last cartel contract and activity has slowed materially. Japan continues to buy scattered cargo lots but the domestic market still drifts, with only a few foundry grades moving.

Buffalo—Although a weak tone pervades the iron and steel scrap market, the chief buyer continues to permit its regular sellers to ship at $13 a ton for No. 1 heavy melting steel and $11 for No. 2. A bearish tone is still evident but some dealers report inquiries being made by foundries, which apparently are low on inventories.

Dealers are keeping an eye on the possible opening date of the navigation season, which is expected to be sometimes during the first half of next month. Shipments from upper lake ports work in competition with the local market. It is believed this may have had something to do with a slightly increase in the tonnage of scrap being offered last week from nearby areas.

Cincinnati— Without support from mill buying, prices on iron and steel scrap turned weaker on adjustments in other districts. Using scrap from inventories, mills are holding ingot production to actual current needs rather than anticipate, either in ingots or in scrap commitments, requirements next quarter.

Detroit—On the basis of recent sales, it appears a general reduction in prices is in order, with the exception of cast grades, which are holding in view of improved activity among foundries as a result of the start of die work.

With no buying for consumption by steel mills, prices on other grades represent what might be termed a "forced speculative" buying or simply courtesy bids made by dealers.

St. Louis—Activity in iron and steel scrap is confined to a few exchanges among dealers picking up material to complete outstanding orders. Purchasing by melters is almost entirely absent, and neither mills nor foundries can give any definite hint as to when they will be in the market for supplies. There have been some adjustments in prices, mainly downward, but lacking test by sales most quotations are nominal. Heavy melting steel is quoted at the low point of the present recessionary movement.

Birmingham, Ala. — Scrap remains in the doldrums. Foundries, as usual, are taking some few carload shipments, but steel scrap is especially out of demand.

Seattle—Oriental scrap buyers are interested but inability to obtain credits and import permits is holding back new orders. Recent shipments have been old commitments,

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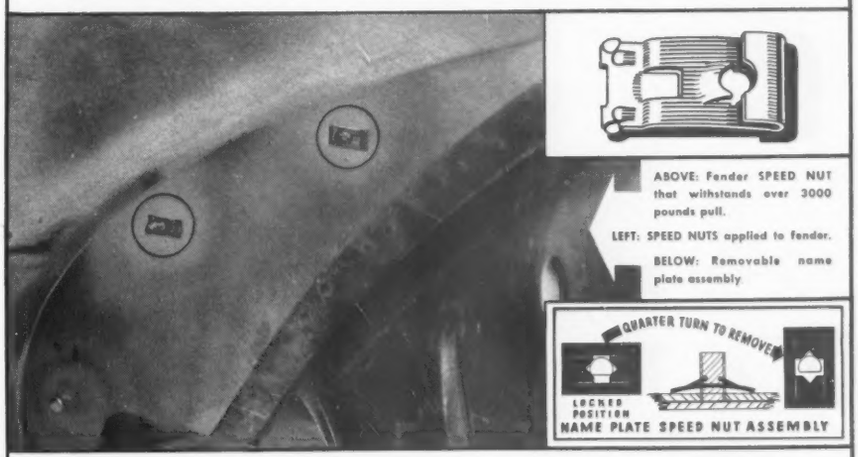
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forwarded as payments are arranged. In the absence of actual transactions prices are nominally unchanged at $7.50 and $8 for No. 1 and No. 2 melting steel. Local sales are small as foundry activity is limited. Tidewater stocks are fairly large but dealers are still buying attractive lots.

Warehouse

Warehouse Prices, Page 97

Cleveland — Sales and shipments out of warehouse have failed to show improvement so far this month. Many distributors look for a moderate improvement over February, which in turn held about on a par with January. Some jobbers have benefited somewhat from irregular mill operation. Jobbers have been inclined to buy more freely for stock since prices have been reaffirmed for second quarter

Chicago—February sales on a daily rate were practically equal to those of January, though the shorter month resulted in a decrease in total business. Warehouses anticipate an upward trend around the middle of March, such a movement being common for this month. Sales lately have held at about the rate of the corresponding 1936 period, but remain well below activity of a year ago.

Boston—Usual seasonal improvement has not appeared. Volume last month was below January with most jobbers even with the shorter month considered. Construction steel, especially reinforcing bars, is moving slowly. Specialties are making a relatively better showing than standard items.

Philadelphia—Jobbers handling a wide line of steel products report March business shows practically no improvement but sellers principally of flat rolled material, especially galvanized sheets, report definite betterment. On the average, jobber sales probably are running a shade ahead of February. Business however, is showing considerable variation in volume from day to day and among various classes of consumers. Warehouses are working inventories as low as possible since the price situation offers no inducements for making heavy replacements.

Buffalo — Warehouse sales are holding steady at the better level which developed in the last week of February. Distributors believe February will be the low point of the downswing. While recent gains in sales were spasmodic, the increased number of orders received is encouraging. Volume, however, is considerably below a year ago.

Cincinnati — Jobbers' sales are slow, although somewhat better tonnage of building materials in February gave hopes for seasonal gains soon. Mill price reaffirmation, immediately reflected in warehouse schedules, failed to bring out any additional tonnage.

St. Louis—Preliminary reports indicate February volume ahead of January, with indications pointing to further betterment in March. Seasonal demands are asserting themselves, and reduced consumer stocks are also a factor. All items, other than the heavier commodities, notably shapes and plates, share in the improvement.

Seattle—Spring buying has not developed. Business is slow and spotty. No item is in particular demand and orders consist of small lots out of stock. Lack of construction, due to high costs of both labor and material, is being severely felt. Washington and Oregon jobbers have reached an understanding under which effective March 1, Portland dealers will maintain the price scale of Seattle houses. Differences applied principally to bars and shapes, prices on plates and sheets having been uniform.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 95

Little more than a slight pickup in bolt, nut and rivet specifications is in early prospect. Railroads show insignificant changes in their requirements, but are counted on to be more active within the next few months. Steady demand continues from farm equipment manufacturers, requirements of this industry still making a more favorable comparison with 1937 volume than other users. Specifications from jobbers continue slow, but replenishment of depleted stocks occasionally is necessary.

Some substantial buying of bolts and nuts has been done recently for the Far East, notably for Manila, and presumably for an ultimate Chinese destination. Current operations are around 30 per cent.

Tin Plate

Tin Plate Prices, Page 94

New York—With walkouts in at least two plants in Brooklyn and with further strikes imminent at certain other canmaking plants in the district, the local outlook in tin plate is somewhat mixed. CIO affiliates threaten strikes at a number of smaller plants and at the moment it appears that the attitude of operators in general will be to close down, if necessary, rather than to accede to demands for higher wages and collective bargaining through CIO.

There are probably as many as 20 of these small canmakers in the district, it is said, and some have been operating actively over recent weeks in an effort to build up stocks in expectation of such trouble as is now developing.

Apparently, CIO will not attempt at this time to make a drive on the larger producing interests, who are in sufficiently strong financial posi-

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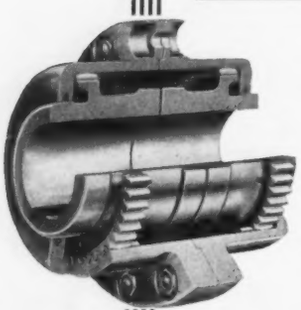
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tion to withstand, if necessary, a prolonged shutdown.

On the other hand, some of the larger canmakers, with plants scattered throughout the country, are expected to increase their specifications, in anticipation of the fish canning season and certain other seasonal requirements. However, they still have fairly sizable stocks on hand, with the result that their releases may continue under normal for this time of the year.

Pittsburgh — With the peak production season at hand, tin plate producers report fair activity, the rate being somewhere between 50 and 60 per cent, probably nearer the top figure. Most demand now is for packers' cans, with numerous fill-in orders coming through. Prospects of better business in general line cans have been seen, although this is contingent on general business conditions and probably will not manifest itself until later in the year.

Iron Ore

Iron Ore Prices, Page 98

New York — Foreign ore buying continues at a standstill, with sellers more occupied at the moment with holding such business as they have on books than in entering new orders. Cancellations have been asked in a number of cases and while no instances have been reported of these requests having been granted, sellers have been lenient to the extent of allowing temporary suspensions of deliveries in some instances.

Sellers are also confronted with rejections where there is failure in adhering rigidly to specifications or making scheduled deliveries. Some of the rejections are being made on what appears to be exceedingly thin ground; however, such cases are the exception rather than the rule, and are noted in periods of extreme dullness such as the consuming trade is now witnessing.

Most consumers have heavy stocks on hand on the basis of the present rate of consumption. For the most part, such ore as is now being moved into this country is on old contracts. At the present rate of consumption, some consumers of foreign iron ore have enough tonnage on their stock piles and under old contracts to last them many months, even enough to last them for a substantial period on a moderately active basis, in fact.

In view of the present lack of buying, foreign ore prices are virtually nominal. Buying on the other side is not as active as last year, but consumption is still on a much higher plane than here and European prices show fair strength, a reflection of which is to be seen in the nominal quotations noted on this side.

Ferroalloys

Ferroalloy Prices, Page 96

New York—Prices on ferromanganese are expected to be extended shortly for second quarter, at least this is the general opinion in the trade. The current market is $102.50, duty paid, Atlantic and Gulf ports.

Meanwhile, ferromanganese shipments show little variation, although with steelmaking operations likely to expand moderately and with an increase in freight rates likely to be announced at any time, there is a possibility that the movement in March will show an increase. On an average daily basis, February shipments are on a parity with the averages for January and December last year.

Most trade interests look for no change in spiegeleisen prices for second quarter, although this conclusion will not be definitely confirmed until producers open their books, which should be soon. The market, meanwhile, on domestic spiegeleisen, 19 to 21 per cent, is $33, Palmerton, Pa., and on 26 to 28 per cent, $39.

Steel in Europe

Foreign Steel Prices, Page 97

London—(*By Cable*)—British steel and iron markets are irregular with pig iron quiet and stocks are accumulating. Heavy steel continues active with lighter products quiet. Sheet trade is dull. The semifinished position is easy with supplies sufficient for needs of rerollers. Export markets are quiet.

Producers of pig iron and heavy steel are operating at a high rate on accumulated orders.

The Continent reports dull conditions with output decreasing. Concessions are being made freely on officially fixed prices.

Tool Steels Marked Down

■ Firth-Sterling Steel Co., McKeesport, Pa., in addition to general reduction of prices on tungsten high-speed tool steel from 80 to 67 cents per pound, as announced in STEEL, Feb. 28, page 98, has marked down certain other grades.

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reduced from $1.40 to $1.34 per pound; XDL steel from 66 to 57 cents; L. T. forging steel from 57 to 51 cents; extra special and finished steel from 54 to 50 cents and J-S punch and chisel steel from 28½ to 27 cents. The new prices were effective Feb. 23.

Farm Equipment Exports In Sharp January Gain

■ Exports of farm implements and machinery from the United States in January were valued at $6,018,037, a gain of 50 per cent over the corresponding month of 1937, according to the machinery division of the department of commerce. Seed separators were exported to the value of $89,983 an increase of 117 per cent over January, 1937.

Wheel tractors shipped abroad during January were valued at $2,110,540 which was 85 per cent greater than a year ago. More than half were of the 15 to 32-belt horsepower sizes but the greatest gain was in sizes over 33-horsepower. Tracklaying tractor exports in January were valued at $1,369,104, an increase of 19 per cent. Overseas sales of harvesting machinery totaled $234,737, which was 41 per cent above the figure of a year ago. Larger sales of combines brought most of this increase.

Celebrate Fiftieth With Venison Dinner

■ Approximately 400 customers, mill representatives and guests attended a venison dinner in observance of the fiftieth anniversary of the founding of Denman & Davis, North Bergen, N. J., at the plant March 5.

Denman & Davis, one of the leading steel warehouse interests in northern New Jersey, was founded in 1888 by Abram C. Denman and William E. Davis, first being located in Manhattan, New York. For the past four years the plant has been located at North Bergen, N. J., with direct sales connections in New York city. R. S. Davis, son of one of the founders, is president.

Philadelphia Sales Tax Will Not Affect Steel

■ A 2 per cent sales tax on products going into direct use went into effect March 1 in Philadelphia. Products for re-use, such as pig iron and scrap, are not affected.

Steel companies with district offices in Philadelphia state the tax will not apply to them, since material will be billed from general offices located in other cities.

Jobbers located in Philadelphia expect to absorb the tax since it will not apply to steel for direct use shipped into the city from nearby cities, such as Camden, N. J.

Canadian Steel Corp. Restores Former Capacity

■ Dominion Steel & Coal Corp. Ltd., Montreal, Que., which in 1937 bought four Canadian subsidiaries of the United States Steel Corp. (STEEL, Aug. 2, 1937, page 25), has reconditioned equipment of Canadian Steel Corp. Ltd., one of the purchased companies, to the original annual capacity. This now provides for drawing and galvanizing 25,000 tons of coarse wire, including bale ties, barbed wire, fence and reinforcing mesh, welded and woven, and for coating 50,000 tons of tin plate and 25,000 tons of galvanized sheets. No additional equipment is being installed by any of the four companies, reports to that effect from Canadian sources being erroneous.

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Nonferrous Metals

Nonferrous Metal Prices, Page 96

New York — Nonferrous metal market observers expect a pickup in sales following the gain last week in lead business as consumer requirements expand moderately in anticipation of a spring business upturn.

Copper — Buying interest here subsided to routine bookings as export copper settled to the domestic 10-cent level. Consumers apparently are ready to place substantial tonnages should events be somewhat more bullish.

Lead — Prices were unchanged at 4.50c, New York, and 4.35c, East St. Louis. Activity in the market tapered gradually after mid-week. It is estimated that March needs are now about two-thirds covered and those for April about 25 per cent. A favorable statistical development was seen in the fact that total lead stocks increased only 2284 tons in January compared with an increase of 4270 tons in refined stocks.

Tin — Prices fluctuated within a narrow margin last week with Straits spot closing around 41.75c compared with a high of 42.25c. The navy department bought 90 long tons at a net price of 41.6706c, making purchases this year of 720 tons.

Equipment

Chicago—Machinery and plant equipment business still lags despite sustained demand for certain types. Inquiries are better maintained than sales, indicating an early revival in buying in the event of a favorable turn in basic conditions. A fair amount of machine tool business from railroads is in prospect, but inquiries from the carriers are spotty as most roads continue to restrict purchases to bare necessities. Small tool demand continues slow. Some foundry equipment builders report noticeable recovery in sales and inquiries the past two weeks.

Seattle—Awards for the Seminoe dam project, Wyo., have been placed, Allis-Chalmers Co., Milwaukee, to furnish a 12,000 kilowatt generator at $102,575, and Pelton Water Wheel Co., San Francisco, a 15,000-horsepower turbine and generator at $75,869. Demand for road machinery is improved, several Washington counties having placed orders for shovels, bulldozers, tractors and other equipment.

Reader Comments

(*Concluded from Page* 19)

need or want. The resources of the country are still tremendous and man power is increasing. The ingenuity of scientists and industrialists is greater today than ever before in finding ways of transforming natural resources into forms which elevate the standards of living and enlarge the spheres of activity of the average individual. Transportation must continually demonstrate the spirit of inquiry and curiosity typical of the man who always believes something better is possible. We cannot afford at any time or in any place to guess about the needs of our business. We must continue to find the facts! If we combine facts, intelligence, character, honesty of purpose and energy in industry and government, we can face the future in full confidence, based on a ready sale of these truths to a willing and waiting buyer, the public."

I think this has as close application to the steel industry as to the railroads and I think it is being followed closely, as developments show. Let's look on the bright side.

STEEL SALESMAN

Chicago.

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Construction and Enterprise

Ohio

CLEVELAND—Allied Printing & Binding Machinery Co., P. V. Jones, president, 3771 Chester avenue, plans factory addition. Cost $40,000.

CLEVELAND—Maurath Inc., G. Maurath, president, 7309 Union avenue, plans constructing new factory. Cost $60,000. Private plans.

WRIGHT FIELD, DAYTON, O.—War department, air corps, takes bids to 10 a.m., March 18, for one high-lift fork type truck with 4000-pound capacity, delivery Langley Field, Hampton, Va.; and for 35,749 pounds black iron or steel sheet, delivery Wright Field Dayton, O.

WRIGHT FIELD, DAYTON, O.—War department, air corps, takes bids to 10 a. m., March 15, for high speed steel involute cutters and push broaches, delivery Wright Field; until 10 a. m., March 16, for six bench lathes and four toolroom precision lathes, delivery Sacramento, Calif.; until 10 a. m., March 17, for 11,500 carriage bolts and nuts in various sizes and quantities, delivery Middletown, Pa., Osborn, O., San Antonio, Tex., San Diego, Calif., Wright Field, Dayton, O.

HILLSBORO, O.—Inter-County Rural Electric Co-operative, V. Miller, Hillsboro, superintendent, plans 660-mile electric line to serve 2000 farmers in Warren, Ross, Highland, Clinton, Pike, Scioto, Brown, Green, Clermont and Fayette counties. Cost $773,000.

NEW CARLISLE, O.—City has engaged Collins Wright, Union Trust building, Dayton, engineer, to make preliminary survey for sewage disposal plant and sewerage system. Cost estimated at $100,000.

TOLEDO, O.—Buckeye Brewing Co., Michigan avenue and Bush street, plans plant improvement. Cost with equipment $150,000.

TOLEDO, O.—Coca-Cola Bottling Co., C. B. Elliott, general manager, plans constructing bottling plant. Hewlett & Best, Richardson building, have plans.

YORKVILLE, O.—Village plans two 18-foot wells, two turbines, 300-gallon-per-minute pump, pump and treatment house and cast-iron water mains. Cost $50,000. P. W. Elwell, 5005 Euclid avenue, Cleveland, engineer.

Michigan

ADRIAN, MICH.—Taxpayers have approved financing for constructing sewage disposal plant addition.

FRANKENMUTH, MICH.—City making plans for complete water system. Cost $65,000. Pate & Hirn, Michigan building, Detroit, engineers.

JACKSON, MICH.—Consumers Power Co., Jackson, is taking bids on materials and all equipment for addition to its generating plant in Kalamazoo. Estimated cost, $290,000.

MARSHALL, MICH.—City plans replacing present equipment in pumping station including combination unit of 150-horsepower electric motor, 2000-gallon-per-minute centrifugal pump, and 150-horsepower gasoline engine to cost $3850. Installation to cost $2000. City also plans purchasing air compressor for WPA storm sewer work.

MUSKEGON HEIGHTS, MICH. — Engineering department of Norge Corp., division of Borg-Warner Corp., has completed plans for erecting new two-story factory unit at Muskegon Heights for the Norge Corp. Estimated cost $400,000.

WHITE PIGEON, MICH.—Eddy Paper Corp., Three Rivers, Mich., has authorized new power plant at branch paper mill in White Pigeon. Fund of $300,000 being arranged for building and equipment.

New York

ASTORIA, N. Y.—Stewart & McGuire, 350 Fifth avenue, New York, vending machine manufacturers, plan altering and improving three-story plant at Thirty-fifth avenue and Thirty-seventh street, Astoria. Cost with equipment $440,000.

COOPERSTOWN, N. Y.—Group of sponsors, care of A. I. Sharpe, Glenfield, N. Y., plans rural electric distribution system in Foster and Griggs counties. Cost $111,000. REA has tentatively approved loan.

NEW YORK—Ever-Ready Welding Co. Inc. has been incorporated here with $20,000 capital by Harold Gerard, 11 Park place.

PLATTSBURG, N. Y.—City, city hall, has sketches for constructing diesel electric generating plant and electric distribution system. Cost $520,000. PWA funds available. LeR. Brown, city engineer. Maturity late in 1938.

SCHENECTADY, N. Y.—City council plans complete filtration plant in connection with proposed swimming pool in Central park. Cost $27,000. WPA labor. Owner will purchase equipment.

STATEN ISLAND, N. Y.—Department of commerce, lighthouse service, takes bids to March 10, for two ¼-horsepower 110-volt electric motors, delivery Staten Island, N. Y.

VALLEY STREAM, N. Y.—Modern Cement Co. Inc. plans rebuilding plant damaged by explosion. Architect and engineer not appointed.

Pennsylvania

CONNELLSVILLE, PA.—Trotter Water Co., Uniontown, Pa., branch of H. C. Frick Coke Co., Pittsburgh, plans filtration plant (additional to pumping station, plant A) including electric motors, pumps, and steel ceiling tank. E. C. Auld, care of H. C. Frick Coke Co., Stottdale, Pa., chief engineer of owner.

HARRISBURG, PA.—General state authority, 600 North Second street, Harrisburg, takes bids to 2 p.m., March 25, for part 2 of White Hill state industrial school for boys, Cumberland county, Pa. Includes power plant, water supply system, electrical distribution system, and sewage disposal plant. Cost of project $2,142,062. Clayton J. Lappley, architect; Henry Hornbostel, consultant architect, Harrisburg.

JOSEPHTOWN, PA.—St. Joseph Lead Co., C. M. Chapin in charge, 250 Park avenue, New York, is preparing plans for power plant, loading and unloading docks, and overall conveyor system near Monaca, Pa. W. B. McBride, Josephtown, Monaca, chief company engineer.

Massachusetts

BOSTON—Massachusetts General hospital, 1 Federal street, plans installing motors and controls, regulators, electric elevators, air conditioning and other equipment in new 15-story hospital unit on Fruit street. Work scheduled to begin in spring. Cost $2,500,000. Coolidge, Shepley, Bulfinch & Abbott, 1 Court street, Boston, architects.

New Jersey

NEWARK, N. J.—Steinhardt Leather Co., McWhorter and Olive streets, plans plant at 205 McWhorter street. Cost $40,000 with equipment.

Illinois

EAST ST. LOUIS, ILL.—Eagle Iron Works Inc., 8100 South Polk street, St. Louis, has been granted a charter to manufacture parts for and erect steel buildings and bridges in Illinois. Capital $60,800. J. W. Kennedy, First National Bank building, East St. Louis, Ill., architect and registered agent.

Alabama

RUSSELLVILLE, ALA. — City receives bids March 15 for constructing complete electrical distribution system. Lide & Adler, Woodward building, Birmingham, engineers. Estimated cost $92,700. Kenneth Markwell, chief project engineer, Volunteer building, Chatta-

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nooga, Tenn. (Noted in STEEL, Feb. 21, 1938).

Kentucky

SADIEVILLE, KY.—Town board of trustees, H. de B. Forbes, Taylor building, Richmond, Ky., engineer, will ask for bids for cast iron pipe, valves and hydrants, meters and pumps, and other materials and equipment for waterworks. Cost $35,000. WPA project. Work to start about March 15.

Georgia

BARNESVILLE, GA.—REA granted to Lamar Electric Membership Corp. $127,000 allotment for farm power project in Pike, Monroe, Upson and Lamar counties. Includes 144 miles and will serve 347 customers.

South Carolina

STATE PARK, S. C. — South Carolina hospital, F. Williams, superintendent, plans sewage disposal plant at tuberculosis sanitorium. Cost $25,000. Engineer not appointed. Appropriation is included in bill before state legislature, already passed by the house.

Tennessee

ATHENS, TENN.—Southern Bell Telephone & Telegraph Co., Frank Garrett, district manager, 500 Union avenue, Knoxville, is having plans and specifications prepared for building on West Washington street, including installing battery system.

CHATTANOOGA, TENN. — Tennessee Electric Power Co., Chattanooga, plans expending $4,371,717 during 1938 including $908,610 for transmission, and $1,653,000 for distribution.

KNOXVILLE, TENN.—Tennessee valley authority, Knoxville, asks for bids until March 2 for 275-ton overhead traveling crane, delivery Guntersville Power plant.

LENOIR CITY, TENN. — Town, M. G. Goodwin, mayor, Kenneth Markwell, chief project engineer, PWA, receives bids March 12 at office of Alexander Bailey, recorder, for constructing electric distribution system. PWA docket No. Tenn. 1192-P-R, sub-project. Cost $49,000. Campbell Wallace, 606 Empire building, Knoxville, Tenn., consulting engineer. (Noted in STEEL, Jan. 24, 1938).

MEMPHIS, TENN. — Memphis light and water division, Thomas H. Allen, chairman, receives bids March 9 for manufacture and delivery f.o.b. cars, Memphis, of transformers for overhead distribution, sub-project contract 26. Estimated cost of equipment $120,000.

Louisiana

BATON ROUGE, LA.—Baton Rouge Electric Co. and Louisiana Steam Generating Corp. will be consolidated with Gulf States Utilities Co., and will be known as Gulf States Utilities Co. Merger will facilitate financing of extension to steam plant north of city. Program for 1938 involves $5,000,000 expenditure.

JEANERETTE, LA.—City, Neil P. Jeffrey, mayor, is considering constructing light and power plant and natural gas distribution system.

Missouri

KENNETT, MO.—City soon takes bids for 2400-kilowatt diesel engines with alternate bids on three 250-kilowatt engines. Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas City, Mo., engineer. (Noted in STEEL, Feb. 14, 1938).

SIKESTON, MO.—Scott-New Madrid-Mississippi Co-operative association, A. G. Gasser, secretary, Sikeston, plans 300-mile rural electric distribution system. REA allotted $140,000 for first unit. Total cost $289,000. E. T. Archer & Co., 609 New England building, Kansas City, Mo., engineer.

Arkansas

BERRYVILLE, ARK.—Carroll County Electric Co-operative Corp. applied to state public utilities commission at Little Rock for permission to construct 200 miles rural electric lines. Cost $200,000.

BLYTHEVILLE, ARK.—Swift & Co., Union stockyards, Chicago, Ill., plans installing motors and controls, conveyors, loaders and other equipment in new cottonseed oil and soy bean oil mill at Blytheville, where site is being selected. Powerhouse included in plans. Cost $450,000.

Oklahoma

ANADARKO, OKLA.—City is in the market for 750-horsepower diesel engine and electric generator. Cost $80,000. F. S. Callahan, mayor.

OKLAHOMA CITY, OKLA.—Radio station KOMA, Biltmore hotel, has made final plans for installing new and additional radio broadcasting equipment. Cost $30,000. Private plans.

OKLAHOMA CITY, OKLA.—Oklahoma Gas & Electric Co., Oklahoma City, will spend $2,861,257 during 1938 for following projects: generating stations, $102,-

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929; transmission system, $179,684; substations, $657,779; distribution system $1,678,534; general repairs and improvements, 206,331. Program includes substation and improvements to substations in Fort Smith and Oklahoma City.

ENID, OKLA.—T. T. Eason plans rebuilding refinery recently damaged by fire. Estimated cost $400,000.

TULSA, OKLA.—Sunray Oil Co., Phillips tower building, Tulsa and Phillips Petroleum Co., Bartlesville, will construct natural gasoline plant in Wichita county, north Texas. Cost $500,000.

Wisconsin

ELMWOOD, WIS.—City is making plans for sanitary sewer system and sewage disposal plant. Cost $40,000. City voted $23,000 bonds for project. Druar & Milinowski, 830 Globe building, St. Paul, Minn., engineers.

MILWAUKEE—Moe Bros. Mfg. Co., 319 East Clybourn street, manufacturer of illuminating fixtures, is completing negotiations with Industrial Realty Co., Ft. Atkinson, Wis., to build $60,000 factory there for lease to Moe Bros. Mfg. Co.

WISCONSIN DELLS, WIS.—Village plans constructing transmission line to Lewiston where power service will be furnished from municipal electric plant. Substation will be built in Lewiston.

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Minnesota

ST. JAMES, MINN. — City, Laurette A. Grogan, city clerk, has changed election date to April 5 to vote on $25,000 bond issue to finance constructing water filtration plant. (Noted in STEEL, Feb. 28, 1938).

Texas

BROWNSVILLE, TEX.—International Great Northern Railway Co. (Missouri Pacific) C. S. Kirkpatrick, chief engineer, Houston, Tex., plans constructing vegetable washing and packing plant on the outskirts of Brownsville. Cost including new equipment and machinery $50,000.

CORPUS CHRISTI, TEX.—Owner, care of Corpus Christi Chamber of Commerce, has sketches for fireproof iron foundry plant.

Kansas

DELPHOS, KANS. — City, J. R. Manual, mayor, is completing plans for constructing sewer system and sewage disposal plant. Cost $65,000. Paulette & Wilson, 311 Farmers Union building, Salina, consulting engineers.

LONGFORD, KANS. — City, Harold Brown, mayor, will soon construct 50,000-gallon elevated water tank. Paulette & Wilson, 311 Farmers Union building, Salina, consulting engineers. Cost $12,000.

MACKSVILLE, KANS.—City, Dr. A. C. Bock, mayor, has completed plans and will ask bids soon on constructing sewage system and disposal plant. Paulette & Wilson, 311 Farmers Union building, Salina, consulting engineers. Cost $55,000.

MARION, KANS.—City, Bruce Gimes, commissioner, will soon purchase distributor and two pumps for sewage disposal plant now under construction. Paulette & Wilson, 311 Farmers Union building, Salina, consulting engineers.

PLAINVILLE, KANS. — City, Harley Bland, city engineer, has completed preliminary plans for constructing sewage disposal plant. Paulette & Wilson, 311 Farmers Union building, Salina, consulting engineers. Cost $30,000.

STOCKTON, KANS. — City, O. M. Goodrich, city manager, has completed preliminary plans and made application to WPA for aid in constructing sewage disposal plant. Cost $40,000. Paulette & Wilson, 311 Farmers Union building, Salina, consulting engineers.

North Dakota

KILLDEAR, N. DAK.—City voted $5000 bonds to finance its share of constructing sanitary sewer system and sewage disposal plant. Cost $65,000. L. Veigel, Dickinson, engineer.

KINDRED, N. DAK.—Cass County Electric Co-operative plans constructing 255 miles additional transmission lines. Cost $561,544. Additional allotment $60,772 approved by REA for construction and cost of finishing original project. M S. Hyland, Fargo, engineer.

NORTHWOOD, N. DAK. — Voters have approved purchase of used diesel engine and constructing addition and improvements at electric light plant. Cost $11,000.

South Dakota

ELK POINT, S. DAK.—Clay union rural electrification project made preliminary plans for additional 80 miles transmission lines to serve northwestern part of Clay county. Buell & Winter, 508 Insurance Exchange building, Sioux City, Iowa, engineers.

Iowa

DAVENPORT, IOWA—Eastern Iowa Light & Power Co-operative plans improvements and extensions to rural electrification. REA allotted $50,000.

ELDORA, IOWA — Boys industrial state school, care of superintendent, will ask for bids soon for constructing sewage disposal plant. Cost $15,000.

ESTHERVILLE, IOWA — City, George Shadle, city clerk, contemplates constructing water softening and filtration plant.

HUMBOLDT, IOWA—Humboldt County Rural Electric Co-operative plans rural electrification. REA allotted $22,000.

OAKLAND, IOWA — City is considering constructing light plant and will vote on bond issue in near future. Renewal of franchise of private plant recently defeated.

OTTUMWA, IOWA — City, David A. Nevin, commissioner, will ask bids soon on constructing pumping station for Green street, consisting of three units, motors, gates etc. (Noted in STEEL, Jan. 24, 1938).

WATERLOO, IOWA—City is making plans and soon takes bids for constructing two sewage disposal plants, one for city use to cost $695,000 and one for packing plant, to cost $69,000. Black & Veatch, 4706 Broadway, Kansas City, Mo., engineers. (Noted in STEEL, Nov. 6, 1937).

Nebraska

AURORA, NEBR.—Hamilton County Rural Public Power District soon takes bids for constructing 319 miles of transmission line. Cost $300,000. Allotment approved by REA. H. H. Henningsen Engineering Co., 316 Union State Bank building, Omaha, consulting engineer.

CENTRAL CITY, NEBR.—Merrick County Rural Public Power District has plans nearing completion for constructing 214 miles of transmission lines. Cost $215,737. Awaiting approval of REA allotment. H. H. Henningsen Engineering Co., 316 Union State Bank building, Omaha, consulting engineer.

COZAD, NEBR. — City, William M. Rumpeltes, clerk, will hold an election soon on proposition to construct municipal electric system to cost $200,000. Robert Fulton, 2327 South Nineteenth street, Lincoln, consulting engineer.

DAVID CITY, NEBR.—Butler County Rural Public Power District plans 350 miles transmission lines now awaiting REA approval. H. H. Henningsen Engineering Co., 316 Union State Bank building, Omaha, consulting engineer.

HASTINGS, NEBR. — Central Nebraska Power & Irrigation District, R. O. Canaday, secretary, Third and St. Joseph avenues, is taking bids to March 15, 11 a.m., for furnishing three traveling cranes and three vertical water-wheel-driven generators and accessories as per specifications on file with George E. Johnson, chief engineer and general manager, care of owner.

LEXINGTON, NEBR. — City, A. A. Kjar, mayor, will hold election soon to determine whether to purchase municipal electric plant distribution system or construct new plant and distribution lines.

LINCOLN, NEBR.—City light and pow-

er department retained Black & Veatch, 4706 Broadway, Kansas City, Mo., to inspect city power plant preliminary to enlargements and improvements including new boilers and switchboards. Cost $175,000. D. L. Erickson, city engineer.

NORTH PLATTE, NEBR.—Platte Valley Public Power and Irrigation District plans extensions in transmission and distribution lines in different parts of the territory, including outdoor power substations and service facilities. $1,000,000 fund has been secured through federal aid for this and other expansion in plants and the system.

ORD, NEBR.—City council authorized city clerk to advertise for bids for purchasing one diesel engine generating unit. Cost $15,000.

PENDER, NEBR. — A committee has been chosen in Thurston county to make consumers survey for rural electrification project. Organization will then be completed and application made to REA. Wallis Malmberg, Pender, is interested.

SEWARD, NEBR.—Seward County Rural Public Power District plans constructing 300 miles transmission lines. Estimated cost $250,000. H. H. Henningsen Engineering Co., 316 Union State Bank building, Omaha, consulting engineer.

WALTHILL, NEBR.—Dixon, Thurston and Dakota Counties Rural Public Power District plans constructing over 300 miles transmission lines. H. H. Henningsen Engineering Co., 316 Union State Bank building, Omaha, engineer.

YORK, NEBR. — City will vote March 16 whether to purchase electric power plant costing not more than $475,000. If rejected, city will construct own plant. Robert Fulton, Lincoln, consulting engineer, has reported that new plant with three diesel-powered units could be built for that amount.

Colorado

LA JUNTA, COLO.—Southern Colorado Power Co., W. N. Clark, general manager, Fourth and Main streets, Pueblo, has proposed to city council that it will build $500,000 steam power plant if granted franchise. Council plans submitting to voters the idea for a $700,000 municipal plant.

Idaho

LEWISTON, IDAHO—Clearwater Valley Light & Power Co. takes bids March 10, for 1700 watthour meters. (Noted in STEEL, Feb. 14, 1938).

Pacific Coast

GUSTINE, CALIF.—Gustine drainage district voted $100,000 bonds to finance drainage wells throughout district, involving 2-20 wells, installing motors and pumps. F. Davis, 2325 Dwight way, Stockton, Calif., engineer.

LONG BEACH, CALIF.—Plans are being prepared for constructing an industrial plant at Long Beach municipal airport for Dalco Inc., for manufacturing retractible landing light assembly for airplanes.

LOS ANGELES—Herbert Engineering Corp. has been incorporated in Los Angeles county with capital stock of $1,000,000. E. P. Fogg, D. Gunning, H. M. Dunham, F. Weber, and G. Rife, directors.

LOS ANGELES—A certificate to conduct business under the name of Supergrate Open Steel Flooring at 750 East Fifty-ninth street has been issued to the owners, Gustav Bostrum, Bell, Calif., and Whiteman Reed, Huntington Park, Calif.

SAN FRANCISCO—Coca-Cola Co., 310 North avenue, Atlanta, Ga., plans installing motors and controls, regulators, electric hoists, conveyors and other equipment in a new multi-story beverage and bottling plant at Third street and Carroll avenue. Work begins in spring. Pacific coast division offices at 963 East Fourth street, Los Angeles.

ANACORTES, WASH.—Sawmill, powerhouse and fuel supply bin of Anacortes Lumber Co. plant were damaged recently by fire.

SEATTLE—Ballard Foundry Co., 4315 Ninth avenue, northwest, will build frame cupola shed.

SEATTLE—Seattle light department takes bids to March 17 for constructing Skagit project No. 2 transmission line, double circuit, 116 miles long, involving 700 miles of wire.

Canada

VANCOUVER, B. C.—The provincial government has purchased a site at Georgia and Bidwell streets on which it proposes building a plant for automobile testing and providing general offices for the motor vehicle branch. Cost $100,000. Completion scheduled for late summer.

SIMCOE, ONT.—Utilities commission, W. D. Stalker, manager, wants prices and information for purchasing transformers (probably 2) for substation.

TORONTO, ONT.—A. Harris, city works commissioner, soon takes bids for water meters. Cost $13,000.

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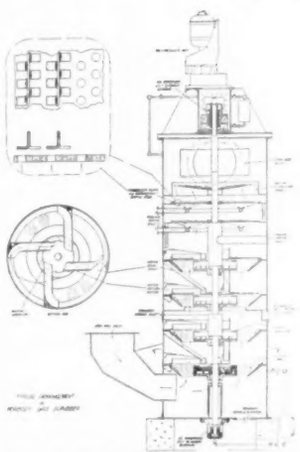

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Republic Steel Corp., Dept. ST, Cleveland, O.
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Republic Steel Corp., Dept. ST, Cleveland, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
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Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Laclede Steel Co., Arcade Bldg., St. Louis, Mo.
*Ludlum Steel Co., Watervliet, N. Y.
*Midvale Co., The, Nicetown, Philadelphia, Pa.
*Republic Steel Corp., Dept. ST, Cleveland, O.
*Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Stanley Works, The, New Britain, Conn. Bridgeport, Conn.
Tennessee Coal, Iron & Railroad Co., Brown Marx Bldg., Birmingham, Ala.
Timken Roller Bearing Co., The, Canton, O.
Weirton Steel Co., Weirton, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

BASKETS (Dipping)
Cambridge Wire Cloth Co., The, 101 Washington St., Cambridge, Md.

BATHS (Heat Treating, High Speed)
Holden, A. F., Co., New Haven, Conn.

BATTERIES (Storage)
Edison, Thomas A., Inc., Orange, N. J.
Electric Storage Battery Co., The, 19th St. & Allegheny Ave., Philadelphia, Pa.

BEAMS, CHANNELS, ANGLES, ETC.
(*Also Stainless)
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie-Illinois Steel Corp., Pittsburgh-Chicago.
Columbia Steel Co., San Francisco, Calif.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
*Jessop Steel Co., Washington, Pa.
*Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
*Ludlum Steel Co., Watervliet, N. Y.
*Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Tennessee Coal, Iron & Railroad Co., Brown Marx Bldg., Birmingham, Ala.
Weirton Steel Co., Weirton, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

BEARINGS (Ball)
Bantam Bearings Corp., South Bend, Ind.
Fafnir Bearing Co., New Britain, Conn.
Hoover Ball & Bearing Co., Ann Arbor, Mich.
NEW DEPARTURE Div., General Motors Corp., Bristol, Conn.
Norma Hoffman Bearings Corp., Stamford, Conn.
SKF Industries, Inc., Front St. and Erie Ave., Philadelphia, Pa.
Torrington Co., The Torrington, Conn.

BEARINGS (Bronze)
Ampco Metal, Inc., 3831 W. Burnham St., Milwaukee, Wis.
Cadman, A. W., Mfg. Co., 28th and Smallman Sts., Pittsburgh, Pa.
Cramp Brass & Iron Foundries Co., Paschall Sta., Philadelphia, Pa.
Lawrenceville Bronze Co., Bessemer Bldg., Pittsburgh, Pa.
National Bearing Metals Corp., 928 Shore Ave., Pittsburgh, Pa.
Shenango-Penn Mold Co., Dover, O.
Shoop Bronze Co., The, 344-360 W. Sixth St., Tarentum, Pa.

BEARINGS (Journal)
Bantam Bearings Corp., South Bend, Ind.
Fafnir Bearing Co., New Britain, Conn.
Hyatt Bearings Div., General Motors Corp., P. O. Box 476, Newark, N. J.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
National Bearing Metals Corp., 928 Shore Ave., Pittsburgh, Pa.
Shafer Bearing Corp., 35 E. Wacker Drive, Chicago, Ill.
SKF Industries, Inc., Front St. and Erie Ave., Philadelphia, Pa.
Timken Roller Bearing Co., The, Canton, O.

BEARINGS (Needle)
Torrington Co., The, Torrington, Conn.

BEARINGS (Oilless)
Rhoades, R. W., Metaline Co., 50 3rd St., Long Island City, N. Y.